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[OFFICIAL NOTICE.]

Twenty-eighth Annual Meeting, American Gas Light Association.

GENERAL ANNOUNCEMENT.

OFFICE OF THE SECRETARY,
NEW YORK, Sept. 13, 1900.

There will be an annual meeting of the American Gas Light Association held at Denver, Col., October 17th to 23d, 1900.

The meeting will be called to order by the President, Mr. George G. Ramsdell, of Philadelphia, Pa., at 10 A.M., on Wednesday, October 17th. The meeting hall will be in the Ordinary of the Brown Palace Hotel. The headquarters will be at the Brown Palace Hotel, Denver, Col.

The most satisfactory quarters are always obtained by writing in advance to the hotel people, and in doing so a reply should be requested, for which a self-addressed, stamped envelope should be enclosed, as misunderstandings may thereby be averted.

The Brown Palace Hotel is conducted on the American and European plans, and rates for rooms will be as follows:

American Plan.—Rooms without bath occupied by one person, from $3 to $5 per day; occupied by two persons, from $6 to $9 per day. Rooms with bath occupied by one person, from $4 to $6 per day; occupied by two persons, from $8 to $10 per day.

European Plan.—Rooms without bath occupied by one person, from $1.50 to $4 per day; occupied by two persons, from $2.50 to $5 per day. Rooms with bath occupied by one person, from $2.50 to $6 per day; occupied by two persons, from $4 to $8 per day.

Other hotels at Denver are the St. James and the Albany, rates at each of which are from $1.50 to $4 per day (American and European plan).

The Roll Call will be made by means of the door card system. Each member upon entering the hall for the first time will at the door receive a special card upon which he will find his name, address, etc., as these appear on the Secretary's books, and such card should be corrected and given to the doorkeeper. Members in attendance should attend to this very carefully, as these cards are used immediately after the meeting for correcting the annual membership list. Visitors will please hand to the doorkeeper their personal cards.

A blank form of application for membership accompanies this circular. More can be obtained of the Secretary. Remember, all applications must be in the Secretary's hands by October 7th, at the very latest, otherwise they will not be acted upon at this meeting.

The list of papers to be read at the meeting is as follows:

"The Use of Cards for Records and Accounts," by Mr. Wm. C. Anderson, Norristown, Pa.

"Inclined Retorts," by Mr. A. H. Barret, Louisville, Ky.

"Gas Advertising," by Mr. C. R. Collins, Seattle, Wash.

"The Uses of Gas for Manufacturing Purposes," by Mr. Jas. H. Walker, Milwaukee, Wis.

"Municipal Control of the Price of Gas," by Mr. Alfred E. Forstall, Montclair, N. J.

If the papers are of a sufficiently high standard the Beal Medal will be awarded to the author of the best paper presented; the question of which is best to be decided by the proper committee.

A lecture will be delivered to the Association, by Dr. E. G. Love, of New York city, upon "The Theory of the Incandescent Gas Light."

In addition to the papers and lecture the report of the Research Committee will deal with the question of the Edgerton Standard referred to the Committee at the last meeting, and with the other subjects that should give rise to a good discussion.

During the days of the meeting all the announcements will be posted on the bulletin boards in the hotel. All members are warned to take notice thereof accordingly.

All members attending the meeting are particularly requested to wear their membership badges in plain sight, thereby greatly aiding the officers and the local committee in their work, by affording a ready means of recognition.

In order that the "Year Book" containing the report of this meeting may be published and issued to the members immediately after the

meeting, notice is hereby given that, if any of the speakers at this meeting desire to correct their remarks before they are printed, they will be given an opportunity before leaving Denver, Col., but not after. The stenographer will have typewritten copy of the principal discussions prepared at the headquarters between the sessions of the meeting, and all those who desire to correct their remarks must notify the Secretary at the close of the session at which such remarks are made, as all the reports will be turned in to the printer immediately after the adjournment of the meeting.

Special rates for transportation have been granted (viz., full fare going and one-third fare returning by the same route), by the several Passenger Associations named and under the conditions noted:

The Trunk Line Passenger Committee, covering territory west of New England and east of Niagara Falls, Buffalo and Salamanca, N. Y.; Pittsburg, Pa.; Bellaire, Ohio; Wheeling, Parkersburg and Charleston, W. Va.

The New England Passenger Association, covering nearly all of the lines in the New England States.

The Central Passenger Association, covering the territory bounded on the east by Pittsburg, Salamanca, Buffalo and Toronto; on the north by the line of and including points on the Grand Trunk Railway from Toronto to Port Huron, thence via Lakes Huron and Michigan to the north line of Cook county, Illinois; on the west by the west line of Cook county and the Illinois and Mississippi rivers, to Cairo, including Burlington, Keokuk, Quincy, Hannibal and St. Louis; and on the south by the Ohio river, including points on either side of that river.

The Southeastern Passenger Association, covering the territory south and west of the Virginias, and south and east of the Ohio and Mississippi rivers.

The Western Passenger Association, covering the territory west of, and not including Chicago, Peoria and St. Louis; in other words, the territory west of that of the Central Association.

[The Secretary here explains at length the conditions necessary to obtain from the Passenger Associations the fare and one-third for the round trip. While the conditions governing this rate for travel are pretty well known, in that they differ in no wise practically from those that ruled heretofore, it is well to keep prominently in mind the fact that the reduction is conditional on there being an attendance at the meeting of not less than 100 persons holding certificates.]

SPECIAL.

As planned at present, the entertainment portion of the programme includes an informal reception at the headquarters—the Brown Palace Hotel—on Thursday evening, and a trip to Colorado Springs and vicinity on Friday and Saturday. This trip is outlined as follows:

Leave Denver Friday morning, reaching Colorado Springs at noon, take lunch at the Alta Vista Hotel, then take carriages for a drive through the Garden of the Gods to Manitou, and up Ute Pass or Engleman's Canon to the Cliff House, where the night will be spent. Music will be provided in the evening and dancing can be arranged for, if desired. The next morning a drive will be taken to Cheyenne Canon and Broadmore, returning to Colorado Springs at noon for lunch at the Alta Vista, and return to Denver in time for the evening trains. The cost of tickets, entitling the holder to hotel accommodations, lunches and seat in carriage for the drives during the trip, will be $5 per ticket. The railroad fare for the round trip between Denver and Colorado Springs will be $2. The total cost of the trip will thus be $7.

Members who have not replied to the letter of August 16th, and indicated their intention in regard to attendance at the meeting, traveling by the special train and participation in the entertainment outlined, will please send in at once, properly filled out, the postal cards sent out with that letter. This is necessary to enable the Committee of Arrangements to proceed with their work.

Be sure to obtain a railroad certificate when buying your ticket for Denver. The greater the number of certificates handed in, the easier it is to get the reduction in rates for future meetings, since the railroad officials count the certificates turned in as marking the full attendance. In our case the number of certificates is from 50 to 100 less than that of the persons in attendance, and our requests for lower rates are not given the consideration they should receive. Could we have shown certificates equal to the full attendance at Niagara Falls and New York we could probably have obtained a rate of one fare plus $2 for the round trip to Denver.

Apply for ticket and certificate at least 30 minutes before train time. Each person must sign his own certificate *at time of purchasing* tickets for Denver, Col. Be sure to hand the Secretary your certificate as soon as you reach the headquarters. Apply for return ticket at least 30 minutes before train time, and have your certificates with you.

All persons, ladies included, attending the meeting are entitled to the reduced rate from the territories named.

Members will please hand their certificates to the Secretary, or his clerk, upon arrival at place of meeting. If there are 100 members present holding certificates each certificate will then be properly endorsed and handed back to the owner before adjournment.

Members having questions which they desire to put into the Question Box should send the same to the Secretary as soon as possible, in order to give him an opportunity to have them printed and distributed to the members before the meeting so as to secure for them careful attention.

Keep this circular in your pocket, and apply to it if you are in doubt.

ALFRED E. FORSTALL, Secretary.

BRIEFLY TOLD.

THE NEXT MEETING OF THE AMERICAN GAS LIGHT ASSOCIATION.—If prediction may go towards making the truth, it looks that the current annual meeting of the American Gas Light Association will be quite up to the standard of any of its predecessors. That it is American in scope is shown from the naming of the meeting place, for it is a long hark, from New York in 1899, to Denver in 1900, but we are all agreed that neither distance nor effort will fail in respect of making the meeting a positive success. Secretary Forstall's official announcement, which has been given proper publicity in the JOURNAL, shows that no movement has been unprepared that might have been arranged for the success of the pleasant and safe transporting of the members and the guests from this line of seaboard to the interior. It is perhaps a trifle late in the day to discuss the motive that directed the Association to convene in Denver; but whatever the directing desire was, it remains that the people in charge of the expressed will of the Association have performed their whole duty. Denver, in October, is finer than New York, so far as climatic conditions go, and those who may not live in comfort in the Brown Palace Hotel, which house has been selected as headquarters and meeting place, would be hard to suit. The paper list is promising, and on it is one number that may tend to show to the younger gas engineers of America that the middle South is somewhat in advance of the middle North, in respect of generating practice. The particular paper suggested is the one by Mr. A. H. Barret, of Louisville, Ky., who, with his usual safe way of going, some time ago, in fact the time amounts to years, visited Europe with a view to investigating on his Company's account what there was in the inclined system. His paper we know will be devoted to a recounting of what his Company has done with inclined retorts in practical operation, and we are also sure that what he will have to say will not be affected in any sense by his personal opinion. In other words, Mr. Barret, as the first practical operator of the inclined retort system in America, will tell the truth about it as he found it in his everyday doing. The other numbers on Secretary Forstall's announcement are attractive enough in name to warrant attentive listeners, and many will await with more than ordinary expectation the plans for "Gas Advertising" that are to be submitted by Mr. C. R. Collins, of Seattle, Wash., whose clever management of a wounded concern has been up to the point of making it a very profitable institution. Those who will attend and share in the meeting should give proper heed to Secretary Forstall's directions or instruction in respect of the transportation means; and he stands ready at any time to tell to inquirers what their inquiries may import.

NOTES.—A correspondent, writing from Milwaukee, Wis., under date of September 25th, says: "The Racine (Wis.) Gas Light Company started its new works, September 26th. This plant was bought by Mr. E. G. Cowdery and associates, of Milwaukee, June 1, 1899. At that time the Company had less than 14 miles of mains, and less than 900 meters, and its output had not reached 20,000,000 cubic feet per annum. Now the Company has 41 miles of main, has 3,000 meters set, and is selling 6,000,000 cubic feet of gas per month. The old plant was and is crowded to its utmost limit the past three months to put out the quantity of gas demanded, the distributing or retaining holder being less than 60,000 cubic feet capacity, and those in charge of the supply were more than relieved when the new plant was put in operation. The latter will be up to an output of 600,000 cubic feet per day—with a half million storage capacity—which plant may, with little additional cost, be virtually doubled. We easily count on an output for 1901 of 100,000,000 cubic feet. Mr. H. H. Hyde, formerly of Saginaw, Mich., is Manager of the Company, and Mr. Ross C. Cornish, for several years with Mr. E. G. Cowdery at the works of the Milwaukee (Wis.) Company, will act as Superintendent."——Mr. F. A. Bates has been named as Superintendent of pipe placing for the new Company at Manitowoc, Wis.——Vice-President, Mr. John Sealy, of the Galveston (Texas) Company, seems to be the right man in the right place. He says, despite flood and disaster, that the plant will be in readiness to resume work before December 20th. Good for Mr. Gimper's managing man.

[From the *Journal of Gas Lighting.*]

The International Gas Congress in Paris.—Proceedings in the Palace of the Congress and Elsewhere, under the Direction of the President, M. Theodore Vautier.

A Review of the Proceedings, Covering the Days Between September 3d and 8th.

There was quite a bustle in the precincts of the hall of the Palais des Congrès on Monday morning of last week (September 3d), just before the early hour of nine o'clock—the time fixed for the commencement of the great International Gas Congress, organized by the Société Technique de l'Industrie du Gaz en France. In the annex to the hall were ranged long tables, on which were piles of the papers to be read and large sheets of paper carefully ruled into divisions and headed for the reception of the signatures of the delegates from the various Gas Associations of the world. Looking down these lists afterwards we saw the signatures of men whom we and the gas profession at large delight to honor—men whose lives seem to be (and manifestly are) devoted to the profession of which they are leaders, and which they have assisted to raise from a mere rule-of-thumb practice to a scientific and intellectual level. We would suggest to the Société Technique that the interesting sheets bearing their signatures, and of all the men gathered together at this the first great International Gas Congress, should be preserved as a memento of the occasion; and upon this record will gaze, with respect and admiration, future generations of gas men who have followed and filled the places of those who will, in time to come, be known only by their work. Walking among the large crowd assembled, the multifarious languages which greeted one's ears were almost confusing. It was quite a study, however, to watch and listen to these many men who are working at the same profession the world over. In action and words, and on countenances, were excitement and pleasure expressed. Old acquaintances—some probably who had been separated for years—met and renewed their friendly relations; introductions were made and new friendships were formed, which, though distance perhaps so soon as to-day has placed a broad gulf between them again, will ever remain dear.

If the Congress results in nothing else than the drawing of the gas profession of different countries together, a not unimportant work will have been accomplished. Knowledge of a man creates a greater interest in his work, and what a Bunte, a von Oechelhaeuser, a Vautier, and many other men are doing will now to many excite a greater personal interest in England, America, Austria, Italy and the other countries mentioned below.

Faithful to their promises, few of the "foreigners" (which description applied to our own English party sounded strange) who had promised attendance failed to put in an appearance, but a considerable number neglected to append their names to the roll. According to the latest returns just before the Congress, England had promised to contribute 90, Germany 110, America 40, Austria 30, Belgium 29, Holland 60, Italy 60, Russia 10, Switzerland 35, and divers 20—making a total of 460. But the signatures which appeared on the presence-sheets of the first day's meeting were approximately a score from each of the countries excepting England, who subscribed something like fifty. When the bell rang announcing that the President (M. Th. Vautier) was prepared to commence the proceedings, there filed into the hall nearly sufficient to fill it—of course the members of the Société Technique du Gaz being in evidence in preponderating numbers. But even when the room was fairly well packed (which was only once during the whole of the sittings, and that was during the delivery of the President's "allocution") there was nothing like the 1,100 which the President had anticipated. But there were a great number who only paid flitting and periodical visits to the séances, and a few who, though in Paris, did not—we regret exceedingly—trouble to attend at all. But the bell had been rung and the hall was filled, and on the raised platform were the President, with the General Secretary, M. Ph. Delahaye (to whom be all praise for his indefatigable exertions in making the Congress a success), the Honorary Presidents (who had received this distinction as Presidents of the foreign societies represented), the recording Secretaries of the different countries who had, as mentioned last week, engaged to prepare summaries of the proceedings, the Secrétaire-Archiviste (M. F. Villeneuve) and some of the members of the Organizing Committee. The Honorary Presidents who took their places at different periods on the platform were: Mr. James W. Helps, of Croydon; Mr. T. O. Paterson, of Birkenhead; Mr. George G. Ramsdell, of Philadelphia; Mr. William McDonald, of Albany (U. S. A.); M. E. Beer, of Berlin; M. D. J. Cramer, Jr., of Rotterdam; M. Victor Krafft, of Naples; M. Hubert Nachtsheim, of Vienna; M. Rothenbach, of Berne, and M. Verstraeten, of Brussels.

Of course, the central figure on the platform was M. Vautier, whose industry and natural aptitude for leading and controlling had brought about the Congress, and if anything was wanting in the course of the proceedings which would have enhanced their value it cannot be charged to any lack of exertion or forethought on the part of M. Vautier. A few words will make him better known to our readers. In the colums of the *Journal* his name has been brought intimately before the gas profession of this country, and several English engineers can claim a personal acquaintance through the very graceful reception of and courteous address to the members of the Gas Institute on the occasion of their visit to Paris in the early part of the summer. In scientific circles of France M. Vautier holds high rank. He is a Civil Engineer, a Doctor of Physical Sciences, Professor of Science at the University of Lyons, President of the Société Technique du Gaz en France, and holding that position he has presided over the work and deliberations of the Organization Commission for the Congress. Such being his qualifications, he was eminently fitted to occupy the distinguished position of President of the Congress. With regard to M. Vautier's connection with the gas profession, he is so placed that he has obtained a peculiarly wide acquaintance with the gas industry of countries in the south of Europe. In Lyons, he directs an office which centralizes the administration of a large number of companies (some of whom are suppliers of both gas and electricity) in France, Italy and Spain. M. Vautier is a Director of these various Companies; and he succeeded in these duties his father, M. Emile Vautier, who took a leading part in the foundation of the Companies in Lyons about the year 1840. M. Vautier's name is a prominent one in the transactions of the Société Technique, to which he has contributed the results of his study of several subjects—notably on the enrichment of poor gas by acetylene; on the mixing of acetylene and ordinary gas; on the photometrical measurement of different incandescent burners; and, as our columns have not long since testified, he has published a learned disquisition on the photometrical methods employed in France and other countries. In the domain of physical science, M. Vautier is the author of several experimental researches, the most important of which are memoirs on the flow of viscous liquids, and on the propagation of sound in cylindrical conduits of great length. In this last work, he was associated with M. Violle, a member of the Institut de France.

This then was the man who by every right—as scholar, investigator, engineer and President of the Société Technique—took his position as the head and conductor of the proceedings of this the first International Gas Congress. In his demeanor throughout he exhibited a coolness, gravity and proper conception of his duties which fitted his dignified position and the occasion. As soon as the hall was filled, he was on his feet, the little bell again tinkled, and the hub-bub caused by numerous voices and moving feet quickly subsided and quietness reigned, but only for a moment. The promiscuous assembly of gas engineers of nearly a dozen countries recognized that before them stood the man who had been the active spirit in bringing them together, and with one accord they blended their voices in hearty greeting, which caused M. Vautier's ordinarily demure countenance to relax with the liveliest gratification. Silence was again restored, and a multitude of faces were expectantly upturned to the President. M. Vautier had prepared his Inaugural Address; and, presumably in view of the vast amount of matter which had to be dealt with within the three days allotted to the sittings, he had kept his oration within reasonable bounds. Yet before such an audience, and with such an opportunity, it would have been pardonable if he had entered with freedom into the subjects of which he is a master, and absorbed a greater amount of time; but he refrained. An indication of the lines upon which the address ran is given in the *résumé* of the technical proceedings which follows this review. The composition and subject matter of the address were enthusiastically approved; but having honored the President to this extent, something like a third of the delegates unceremoniously made their exit from the hall, and many of them during the sittings did not again see its interior—in fact, the main design of their visit to Paris was forgotten in the seductive counter attractions of the vast exhibition and the beautiful weather. So that, from this point (although there was always a very fair attendance, and many were punctilious and observant in their following of the proceedings) the numbers present rose and fell hour by hour with a fickleness equal to the barometrical inconstancies which we have been experiencing at home during this summer.

Again the bell rang, and again order was restored; and the President called upon Dr. H. Bunte, of Carlsruhe, to read the first paper, on "Incandescent Gas Lighting." Revered by all gas men, not only for

his great erudition and research in gas technics, but for his innate personal charms, his appearance on the platform was signalized by a spontaneous greeting which few men could have expected to receive in an audience of such heterogeneity. But having introduced the papers, it is convenient here to turn for a moment from the course the proceedings took to say that the order in which the papers were disposed of was determined at the Committee meeting held on the preceding Saturday. In all there were 29 papers; and in the three days 26 of them were read, or their contents described—the other three being taken as read owing to the absence, temporary or otherwise, of their authors. In addition to the address, four papers were read on Monday morning, and six in the afternoon; four on Tuesday morning, and an equal number in the afternuoon; five on Wednesday morning, and four in the afternoon. With such a bulk of material to present, little time could be wasted; and when there was any hesitancy in commencing discussions, after invitations had been addressed to the audience in (in some cases) two or three languages, it was taken that the Congress were in full agreement with the author, and the next paper was at once presented. In this way the full programme, as settled by the Committee, was duly completed in the time allotted. On Dr. Bunte's paper there was no discussion; and the next paper by Messrs. Stoecklin, Rieder et Cie., was taken in hand. It dealt with a kindred subject to that dwelt upon by Dr. Bunte—viz., "The Photometry of Incandescent Mantles;" and it culminated in the appointment of an International Committee who are charged with the duty of examining into, and establishing, a set of conditions for the regulation of the photometry of gas mantles. On the Committee four English representatives have been nominated—Messrs. T. O. Paterson, J. W. Helps, C. C. Carpenter and Professor Lewes. Germany, France, Belgium, Italy, Holland, Switzerland and the United States are also to have representatives. Dr. Bunte and M. Vautier are among those already chosen to serve; and, as students of this particular subject, their assistance in arriving at definite conclusions will be invaluable. The wide separation of the Committee, and the inconvenience of leaving work and traveling long distances for consultative purposes, will, we fear, operate somewhat against this well meant effort; but, with many others in the gas industry, we hope to see it bear good fruit. No words are required to emphasize the importance of the subject; the arguments in favor being all self-evident. If in any way the *Journal* can be of service to the Committee, its columns are at their disposal. It may be mentioned that the Secretary to the Committee is M. Delahaye, of the Société Technique du Gaz.

During the Congress, the English party received many little tokens of the regard and friendliness of their French compeers; and it was with much appreciation that they heard M. Vautier call upon Mr. J. W. Helps, the President of the Institution of Gas Engineers, to succeed him in the chair before the third paper was read. This paper was by Mr. C. E. Brackenbury; and it dealt with a subject upon which the author can speak with some authority, and upon which he not long since made some remarks of sufficient effectiveness and poignancy to attract attention. But that is a bygone; and, while perhaps the chief disputants have not receded one jot from their positions, the Paris meeting has at least had the effect of bringing about their better acquaintance. This, however, is merely by the way. Mr. Brackenbury read his contribution on "Inclined Retorts" in French with a fluency which at once provoked the admiration and envy of his compatriots. The communication gave rise to a splendid discussion; and among others it brought into prominence the inventor of this system of carbonizing—M. Coze—who, on being announced, received the plaudits of the meeting. It is to be regretted that not a single English gas engineer spoke on the paper. The next paper was likewise related (as were the following two) to the carbonization of coal. M. Eichelbrenner was not present to read his contribution, which recorded his experiences on the question of "Independent Producers for Retort Benches"—an interesting topic upon which, had it been open for debate, Mr. C. C. Carpenter might well have added his views. "The Measurement of High Temperatures" was the next subject to claim attention; and it was treated upon by Mr. Alten S. Miller, of New York. English speakers alone took part in the discussion, which was not altogether favorable to the instrument described.

The honor of directing the proceedings in the afternoon of Monday fell upon M. E. Beer, the President of the German Gas and Water Association. M. Euchène opened the sitting by discoursing as entertainingly as the subject would permit on "The Thermic Reactions in the Carbonization of Coal, and the Recording of High Temperatures." Contributions on water-gas questions came next from M. Sospizio and Herr A. Dicke. They were of a character which admitted of joint discussion, in which Mr. A. G. Glasgow, Dr. Leybold, M. Vautier, and M. Salomons were prominent. How to prevent naphthaline obstructions (which subject has been a standing dish ever since gas engineers first met in conference) was told by Dr. Bueb, of Dessau; and the same author dilated on the question of the manufacture of cyanides. A cognate subject was handled by Dr. A. Smits, of Amsterdam; but he was not present to read the paper. There was a good discussion—among the speakers on the first-named subject being Mr. J. P. Leather, who testified to his successful experience at Burnley; and on the latter M. Salomons and Mr. William Foulis subscribed useful information. Herr von Oechelhaeuser was also well in evidence on these and other subjects.

Tuesday morning saw England again honored by the installation of Mr. T. O. Paterson, the President of the Gas Institute, in the central position on the platform. A splendid auditory had assembled to hear Mr. F. D. Marshall's paper on the "Mechanical Handling of Coal," which paper he had prepared in English. "For in spite of all temptations to belong to other nations, he remains an Englishman." (*Vide* the Centenary of Gas Lighting cartoon.) But very kindly, as the subject had already been dealt with by Mr. Marshall before the Institution of Gas Engineers, M. Krafft, of Naples, converted the paper into French, and himself read it to the meeting. Large diagrams, some of which have seen service before on this side, were exposed to illustrate the plant described. We understand that it was Mr. Marshall's intention to contribute a paper on inclined retorts; but it was by the special request of the Committee that he dealt with the subject laid before the Congress. But when Mr. Marshall wants to relieve himself on the question of inclined retorts, there are the *Journal* columns or one of the meetings of the Institution of Gas Engineers in or at which he could usefully do so. A companion paper to Mr. Marshall's was contributed by M. Louvel. It explained methods and plants adopted at the works of the Paris Gas Company for dealing with coke; and he went to great pains to let his audience gain a clear understanding of the plant. He was rewarded at the close by considerable applause. Again there was a change in the presidential chair; Mr. G. G. Ramsdell, President of the American Gas Light Association, being desired by M. Vautier to take the honorable position. By this time, however, the attendance had appreciably thinned; and when Mr. Frederick H. Shelton, of Philadelphia, rose to explain the results of his experience and study of the question of "Reducing the Cost of Distribution by the Use of High Pressures," he had not such a splendid audience as his predecessors in the morning's programme. This was a pity, as the matter is one which bids fair to receive extended and serious attention. However, the author had the satisfaction of hearing a far better discussion on his effort than had many of the previous contributors to the proceedings. When the next paper was called, dealing with the subject of "Diminishing the Loss of Gas in Distribution," the author, Mr. P. H. Gibbons, also of Philadelphia, was absent; and consequently, Mr. Ramsdell gave place to M. Rothenbach, the President of the Swiss Gas and Water Association. Under his chairmanship, M. Weiss, of Zurich, read a paper, a large part of which consisted of tabular information concerning the operations of different works in Switzerland. Plans of the new gas works at Zurich and of the works at Winterthur and Geneva were also explained. In connection with the Zurich works, M. Weiss asserted that they did not experience any trouble from the slipping of the coal charges in inclined retorts; and the point produced some interesting remarks. But some trouble was experienced in eliciting all the information which M. Weiss could have afforded on this and other points, if he could have comprehended the questions put to him in divers languages. Owing to this, not only with reference to this paper but others, there is no doubt that much that would have been valuable and instructive was lost during the Congress.

The President on Tuesday afternoon was M. Verstraeten, of the Belgian Society; and while he was in the chair there were some interesting communications. In M. Witz's contribution on "Gas Engines and their Gas Supply" suppliers and users of gas engines will derive some very serviceable knowledge; and the papers which followed, dealing with gas lighting from different aspects, will be found very informative. The authors were MM. Salzenberg, Himmel, and Lecomte. M. Lecomte is an earnest student of all matters affecting burners and lighting; and he delivered himself on this occasion (almost without a reference to his print) with a volubility, readiness, and a display of cognition which caused those to marvel who had not before heard him on his favorite topic.

During the afternoon, there was a little break in the proceedings, to enable M. Brix to give some particulars as to a special gas and water exhibition which it is proposed to hold in Vienna next year; and he

expressed the hope that many of the members of the Congress would make an effort to be there. In a pamphlet dealing with the projected exhibition, it is stated that the Committee's idea is to celebrate the hundredth anniversary of the general use of gas for lighting purposes, and they have settled upon the city of Vienna as being the most suitable—first, because it is the place chosen for the next meeting of the German Gas and Water Association; secondly, because Vienna possesses one of the largest of recently constructed gas works; and, lastly, but not least, because Vienna was so intimately associated with the invention of Dr. Auer von Welsbach.

Allied to some extent to the last subjects considered, was a proposal that a movement be set on foot among makers of gasfittings with the object of producing more artistic patterns, "combining æsthetics with the advantages of incandescence by gas, account being taken of its lighting intensity, and of the smaller sizes of pipes which will henceforth suffice for obtaining a determined illuminating power." The Congress decided to invite Gas Associations to institute competitions on these lines, and to communicate to each other the results arrived at. Not long since, we saw some beautiful examples of artistic gasfittings for incandescent lighting at the Royal Aquarium Exhibition; but at the same time there is no reason why competitions should not produce something of superior merit. Therefore we commend the suggestion of the Congress to our own Gas Associations.

The morning sitting on Wednesday contained a great deal of interest for English engineers. The honor of presiding was divided between Mr. W. McDonald, representing the Western (U. S. A.) Gas Association, and M. D. J. Cramer, of Rotterdam. A paper on "The Educational Fund of the American Gas Light Association," written by Mr. Alfred E. Forstall, of New York, was successful in drawing a good discussion, in which Mr. J.W. Helps and Mr. Charles Hunt commented upon the "Gas Manufacture" examinations of the City and Guilds of London Institute. Their remarks (the principal points in which we publish in our *résumé* of the technical proceedings) may induce the proper authorities to give some attention to this matter; for of our own knowledge, through verbal and written communications, there is not any very general satisfaction with the present examinations, even among candidates who have passed successfully through them. Succeeding Mr. Forstall's paper was one by M. Hedde, of Paris, on the question of interesting gas stokers in their work; and this gave Mr. C. E. Botley an opportunity of relating how he has accomplished the gaining of the interest of his men by a very simple process. The next paper was by M. Bouvier on "The Comparison of the Usual Methods of Lighting;" and incandescent lighting came out remarkably well. A question which has been troubling our own Gas Associations—viz., the standardizing of the threads of screws for gasfittings—was introduced by M. J. Bengel, of Paris. France seems to be a great sufferer in respect of the varation of screw threads; and the Congress decided to supplement the already difficult task with which the International Committee on the Photometry of Incandescent Burners are charged by deputing them to use their best efforts to bring about harmony in respect to screw threads. Not the least interesting communication of the morning was a paper by M. Bolsius on "Prepayment Meters in Holland;" and, by figures, he disclosed the wisdom of pursuing an enlightened and liberal policy in connection with the system.

M. Krafft, the General Secretary of the Italian Gas Association, was the occupant of the chair on Wednesday afternoon; and at the commencement an extremely long paper on intensified lighting and cooking and heating by gas in Paris was summarized by M. Lévy. The brilliant examples of incandescent gas lighting which are now to be seen in Paris, through the energy and enterprise of the Paris Gas Company, invested the first part of the paper with considerable interest; and, in due course, we shall present our readers with a fuller notice than we are able to do in our *résumé* of the paper which appears elsewhere to-day. In two papers, M. Bigeard and M. Asselbergs expounded their views on the well-worn subject of consumers' wet and dry gas meters; and the discussion which followed indicated that on the Continent opinion is as divided as to the relative merits of the two classes as it is in this country. If not instructive, the final paper, from the pen of M. Guichard, was interesting in that it described difficulties of a kind with which fortunately we are not so well acquainted in this country, in connection with the use of incandescent mantles for public lighting in Guayaquil, a town in Ecuador. Torrential rains and the invasion of insects are the two great enemies against which the mantles have to be protected.

The technical proceedings finished, there was a charming exchange of courtesies between M. Vautier on the part of the hosts and Dr. Bunte, as a chief among the visitors. In the success of this Congress, M. Vautier saw a happy augury for the future; and consequently he would not say "*adieu*" to his visitors, but only "*au revoir*." In appropriate phrase and words, which were punctuated by the approbation of all the visitors present, Dr. Bunte thanked M. Vautier and the Société Technique both for the cordiality with which they had received their visitors and the perfect arrangements they had made for the Congress. We may add the hope that these *réunions* will become a periodical institution.

There a few matters of interest which occurred outside the Palais des Congrès to which reference must be made in order to complete this review of the week's proceedings. On Monday evening there was a reception of the delegates and their lady friends by the President and the Société Technique at the Hotel Continental; and it was a most brilliant affair. M. Vautier very courteously received his visitors, shaking hands with each, in the beautiful saloon in which the entertainment of the evening was provided. The programme of music and dance, which commenced about 9 o'clock, did not conclude much before midnight. The character of the music and dancing was charming, refined, and graceful. Refreshments were also served; and one and all left the hotel filled with the enjoyment of the evening, and impressed with the view that in Paris they know how to do these things, and that niggardliness is an unknown quantity when the pleasure of guests is in question.

During the midday adjournment on Tuesday, M. Vautier entertained the Honorary Presidents, members of the Organization Committee, Secretaries, and others to luncheon; and, in turn, the latter invited M. Vautier to dinner on Wednesday night at the Restaurant Voisin, Rue St. Honoré. M. Krafft, of the Italian Gas Association, was in the chair; and M. Vautier occupied the place of honor on his right. The greatest cordiality prevailed. Speeches were made by Mr. Marshall, Mr. Helps,-Herr von Oechelhaeuser, Mr. W. T. Dunn of the Gas Institute, a representative of the Paris Gas Company, and others. The value of such gatherings was pointed out as a means of bringing engineers more closely into personal contact, and also from an international point of view. Cordial thanks were expressed to the Société Technique and to the Paris Gas Company for their great hospitality. M. Vautier and others made appreciative speeches in response. M. Delahaye supplied a feature of the evening. In responding to the toast of his health, he gave the Sovereign or President of each country represented at the Congress.

On Tuesday evening, a visit was paid by members of the Congress to the show rooms of the Paris Gas Company, 28 Rue du Quatre-Septembre, where a great variety of gas burners and other apparatus were on view. The many forms of incandescent lighting exhibited were a striking feature; and a horizontal type of burner (the "Heliogène") with fringes of asbestos, claimed some attention. Perhaps most interesting of all was the Scott-Snell-Phillips self-intensifying lamp, of which details were given in the *Journal* for Aug. 14. Gas engines and compressors, manufactured by the Company, were shown at work. The visitors were very generously entertained by their hosts.

Interesting mementoes of the Congress were photographically secured on Thursday morning. Near the Palais des Congrès, as many members of the Congress as could make it convenient to attend assembled; and a photograph was taken first, of the President (M. Vautier) and all those who had been officially identified with him, and then of the whole body. In the afternoon, by invitation of the Directors of the Paris Gas Company, a number of the delegates proceeded, by saloon steamboats, to the Clichy Gas Works. This event is noticed at greater length after the *résumé* of the technical proceedings.

Of course, during their stay in Paris the delegates spent their time liberally in viewing the Exhibition and the Gas Pavilion; and very greatly admired were the displays in the grounds of intensive incandescent lighting by the Paris Gas Company.

Gathered together under such genial circumstances, and having the strong position of the Société Technique du Gaz brought into comparison with their own respective conditions, it was not surprising that the members of the Institution of Gas Engineers and the Gas Institute should take the opportunity of informally talking over matters affecting the question of amalgamation; but no suggestion, so far as we can learn, was made which in any way has advanced the solution of the difficulty that blocks the way to the much-desired end.

By the end of the week, most of the English delegates had left Paris; and many of them have brought back recollections, which will be of an abiding character, of the kindly and courteous treatment of which they were the recipients at the hands of their colleagues across the Channel.

The Reduction of the Cost of Distribution by the Use of High Pressures.[1]

[A paper read by MR. FREDERICK H. SHELTON, of Philadelphia, Pa., at the International Congress of Gas Engineers, Paris, France, September 3, 4 and 5.]

For many years gas engineers have been steadily reducing both the operating and the investment costs necessary in the manufacturing department of the gas business. But if inquiry is made as to what material reduction of necessary investment, or what advance has been made in the department of distribution, it is difficult to point out anything very different from, or notably better than, the practice of 20 or even more years ago. While it is a compliment to the efficiency of standard gas distribution appliances that the inventive minds of many years have been unable to bring forth better forms, it is none the less a fact that, because of the continuation of settled forms and of a lack of improvement, the cost of our distribution system is to-day, for given volumes of business to be handled, practically as great as ever.

Some Advantages of High Pressure.—Perhaps the most striking feature in the present practice of gas distribution is the extremely low pressure at which gas is delivered—average pressures of 2 to 6 inches water pressure equaling but a tenth or a fifth of one pound steam pressure. If customary pressures could be increased so that pipes of given size would deliver 10 to 15 times the volume of gas now handled, would it not enormously cheapen the cost of distributing systems?

I have given this matter much thought for upwards of two years past, and some time ago reached the conclusion that illuminating gas could, just as well as not, be distributed satisfactorily at a number of pounds pressure, say from 10 to 30, instead of at but a small fraction of one pound, and that by such plan of working either present pipes could be made to handle several times the quantity of gas now delivered, or else that much smaller pipes would serve as well.

According to the formula of Pole, usually used in such matters, an 8-inch pipe four miles long, under present customary pressures of 6 or 8 inches, will deliver at the far end 8,000 to 9,500 cubic feet of gas per hour. Under a range of 20 to 30 pounds pressure, and operating as later described, by well accepted formulæ for the flow of gas of 0.650 gravity in such range of pressure, it could deliver 140,000 cubic feet per hour. A 2-inch pipe 1,000 yards long would deliver 650 to 750 cubic feet, compared with 4,600 cubic feet. A 12-inch pipe two miles long would deliver 33,000 to 38,000 cubic feet, compared with 550,000 cubic feet. To supply gas to a point 4½ miles distant at the rate of 10,000 cubic feet per hour, on present lines, in a recent instance figured upon, would have required a 10-inch pipe, costing about $26,000. With high pressure, however, a 3-inch pipe, costing but $10,000, gives equal capacity. To supply 15,000 cubic feet an hour at a point six miles distant, in another instance, required a 12-inch main at a cost of $40,000, while with high pressure, as hereafter described, a main of but 4 inches diameter would have given the same capacity at a cost of $16,000.

I have recently had occasion to figure upon the construction of a distributing system, including 25 miles of pipe in the usual amounts of sizes, from 3 to 12 inches in diameter, the estimated cost of which was $82,000. The construction cost of a high pressure system in the same locality, with pipes ranging from 1½ to 4 inches in size, and including the extra cost of complete pumping equipment and consumers' house regulators, etc., was but $43,000, a saving of about 47 per cent.

Indirect Precedents.—This paper is more particularly directed to showing the feasibility of working at high pressure rather than to the figuring of savings to be made in assumed cases, each of which, whether real or imaginary, would differ from its neighbor, and would have to be figured upon its own conditions. I am assuming that the saving is so obvious, in a system that would make gas mains of a dozen times present capacity, that it is not the exact degree of gain to be made that may interest you so much as it is the manner of so operating, and the practicability of such a system. For, on the one hand is an investment which, even after the cost of the unusual pumping machinery and high pressure regulators and appliances are allowed for, is yet but a half of that ordinarily necessary; while on the other hand the increased operating expense of a high pressure system—chiefly involved in the running of a moderate size gas compressing pump—is so slight as to only fractionally offset, and so small as not to begin to neutralize the advantage gained.

Illuminating gas, it should be remembered, is the only extensively handled commercial fluid that is delivered at a very low pressure. Water, steam, compressed air, natural gas, Pintsch gas, refrigerating fluids, etc., have been and are being widely distributed, sold or handled, for years in public places in several of the principal cities of the civilized world, and to such extent and in so many ways as to fully justify the statement that a number of pounds pressure in itself, in such matters, is neither unsafe nor infeasible. The mechanism and appliances for controlling these various fluids, even at pressures up to several hundreds of pounds, have been well worked out into adequate and standard forms that fully serve the purposes of commercial industries. It is indeed curious, when one reflects upon it, that for so many years illuminating gas has continued to be distributed at but a small fraction of a pound pressure when all other liquids supplied by public companies are sent out usually at far greater pressures; and the universal tendency in such things is to increased tension. The reason for the continuance of low pressure with illuminating gas is no doubt the fact that relatively, and in the past, before the advent of any great volume of fuel business, the actual quantities of gas required to be handled have been small, and it has been found comparatively easy to provide pipes of sufficient size, and without undue cost, that would convey all the gas required. While such conditions have existed in the past, it is a question whether in the near future, for the reasons already stated, gas engineers will not find it both necessary and profitable to replace pipe diameter—convenient but expensive—by readily supplied pressure, to best distribute large volumes.

While some companies in the United States have slightly increased their pressures to increase the carrying capacity of their street mains, by the introduction of mechanical appliances, such as rotary blowers, to reinforce the pressure given by the gasholders, it has almost invariably been solely for the purpose of transmitting gas from one distributing point to another, and within pressures not exceeding 50 inches of water; and no general delivery of gas to the customer direct, and through all the mains at some pounds pressure, had been undertaken to my knowledge. The only instances among the 1,000 companies in the United States of which I have been able to learn wherein gas is being noticeably compressed, in connection with public supply or service, are as follows:

Direct Precedents.—In Louisville, Kentucky, coal gas has been pumped for about 2½ years by a piston compressor of about 30 by 36 inch cylinder size, at the rate of about 140,000 cubic feet per hour, through a 10-inch wrought iron pipe, a distance of some 2¾ miles, for the purpose of filling outlying gasholders throwing a pressure of 10 inches. In this case no consumers are served along the line; no loss of candle power has been observed. The initial pressure of 5 to 7 pounds is only that sufficient to overcome the friction of the pipe while filling the holder against 10 inches pressure at the rate per hour designated. In Oakland, California, for about 10 years a mixed coal and water gas has been pumped by a piston compressor a distance of 8 miles, to Alameda, through an 8-inch cast iron pipe with lead joints; also for the purpose of filling a gasholder at an outlying point. In this instance the initial pressure carried is 5 pounds; the terminal holder pressure is 4 inches. No individual consumers are taken off the line, although midway a governor of the Connelly type controls a supply of gas taken from the main for the district of East Oakland. The loss of candle power observed, due to compression, etc., is said to be slight, and not to exceed a quarter of a candle. In Chicago, Illinois, for some years water gas has been pumped in the southern portion of the city from the plant of the Mutual Company's works, a distance of about 23,000 feet, through an 8 inch pipe line, for the purpose of filling an outlying holder. In this instance a rotary exhauster of the Root pattern is used, giving an initial pressure of 10 pounds, and passing gas at the rate of about 60,000 cubic feet per hour into the holder against a pressure of 7½ inches. No consumers are taken off *en route*. In Danbury, Connecticut, for 10 years past a 35-candle power oil-water-gas has been pumped, under 40 pounds pressure, through a 2-inch wrought iron pipe by a piston compressor a distance of 3 miles into stationary wrought iron tanks. From these tanks the gas, controlled by a suitable governor, is supplied to the small town of Bethel, at customary low pressure. No consumers are taken off *en route;* and no loss of candle power is observed.

Requirements of High Pressure Distribution.—It is clear that the satisfactory distribution of gas direct from the gas works to consumers at some pounds pressure, in order that they may be safely and well served through mains much smaller than the ordinary, would specifically require:

1. Street mains of long life, with joints originally made tight and that will stay tight.

2. Machinery for compressing and pumping in which the likelihood of breaking down is remote.

1. Reprinted from the *Gas World*.

3. Regulating main governors, reliable in character, for reducing the pressure of the high pressure line to any desired low (ordinary) pressure in any given district.

4. Individual house governors, reliable in character, to enable the supply of customers anywhere along the high pressure line.

5. Adequate safety appliances, so that in the possible event of any pressure regulating mechanism failing to work no damage can result other than the loss of gas.

6. Means for safely and easily putting in additional service pipes at any time on the high pressure pipes while under pressure, without shutting off the supply to existing customers.

7. Freedom from loss of candle power to any serious extent because of the compression.

Without consuming time unnecessarily by the relation of the detail of extended investigation, I became, and am convinced:

First, that in the high pressure gas work, wrought iron screw pipe, well coated against corrosion and carefully laid, will afford a practically tight system of gas mains and will last in most situations sufficiently well. The experience of 10 to 15 years of the natural gas companies, and others in the United States, with wrought iron pipe gives warrant for this conclusion.

Second, that the standard types of air compressors, built to withstand severe usage in distant mining districts, are, with slight modifications, entirely suitable for pumping gas at some pounds pressure, are practically free from and are no more liable to breakdowns than are ordinary steam engines, and can be installed in duplicate at such moderate cost as to completely cover the fullest requirements of safety and insurance of supply. The thousands of air compressors in use throughout the world, as well as the many Pintsch compressing stations, give full warrant for this conclusion.

Third, that the district governors and regulators used for years in the natural gas fields in the United States will control any volume of illuminating gas from and to any range of given and desired pressure, and are so moderate in cost, simple in form, and so compact as to enable their ready arrangement in duplicate, giving ample opportunity for inspection, cleaning, adjustment, etc. The very extended and satisfactory experience with such regulators by natural gas companies gives warrant for this assumption.

Fourth, that the inexpensive individual house governors, also used throughout the natural gas districts with great reliance and satisfaction, will equally well serve with illuminating gas. These governors are practically the same in type as those used in the Pintsch system of car lighting in about 100,000 cars throughout the world, and for many years with an almost entire absence of accident or trouble.

Fifth, that the use of simple forms of oil seals, or safety vents, will fully protect, as desired, either a district at large or one or more individual customers from danger or damage in the remote, though possible, event of a defective pressure regulating device working improperly. Such precaution is used in the natural gas fields, and is believed, and has so far been found, to give entire protection.

Sixth, that by the use of a saddle or lug bolted on to the gas main and a suitable pressure tapping device, service pipes can be easily added as desired without inserting a tee, interrupting the supply of gas, or increased expense, and with less danger and trouble than are involved in the present practice.

Seventh, that where high compression to, say, 200 pounds, would seriously affect the candle power of the gas compression to but 20 or 30 pounds—provided the gas is an ordinary coal gas or well made water gas—will not decrease the candle power visibly, or over the fraction of a candle, or enough to be an objection commercially.

Having satisfied myself upon each of the points as above, fully and in general, that illuminating gas could, with proper equipment, be readily distributed at 20 pounds pressure, and an opportunity offering, within the past year, demonstration was made of my belief.

A Practical Trial.—The towns of Phœnixville and Royersford, 28 miles from Philadelphia, are about 5 miles apart, and together contain about 16,000 people. Each of these towns has had a gas company for many years. Both of these companies were purchased last summer by the Consolidated Schuylkill Gas Company, controlled by myself and some associates. It was decided to lay a high pressure connecting main from one to the other in order that the operation of the smaller gas plant could be discontinued and all gas making be centered at one point. Between the two stations a 3-inch wrought iron pipe, 23,015 feet in length, was laid, especial care being taken in the making of the joints and the testing throughout. When finished it was tight under 60 pounds pressure. The pipe was laid about 3½ to 4 feet deep along the line of a moderately hilly country road. At the far end of the line two regulators or governors, set tandem, are used to reduce the varying pressure of several pounds in the pipe line to that desired in the low pressure existing mains, namely, a uniform 2 7 inches. The first governor is adjusted to reduce any pressure ranging up to 50 pounds down to 1 pound, and the second governor, more sensitive in its action, is set to reduce the gas at 1 pound to the 2.7 inches named; both governors are of the non-freezing, dry diaphragm type.

For the first two months a small gasholder at Royersford was used in connection with the pipe line to insure the safety of supply and until it was felt that the system, as a whole, was in complete running order. That condition being reached within that period the gasholder was then shut off, and since that time the town has been served with its illuminating gas direct from the high pressure main through the regulators, from a point nearly 5 miles away and without the use of a holder or storage receptacle. It is my understanding that this is the first instance of this being done. The gas served is an ordinary illuminating gas of about 20 to 22 candle power, made from naphtha. The general apparatus is an old one of the Lowe type, and of inferior design, the superheating capacity being much less than it should be, with the result that the gas made is but partially "fixed." Under these conditions it would be expected that the compression would result in considerably reducing the candle power by the throwing down of the unfixed illuminants. No particular depreciation in candle power, however, has been observed, the gas at the far end of the line being, generally speaking, of good commercial quality and of practically the same grade as that delivered at the starting point. While variations in candle power have been noticed, they are due to irregularity in the quality of gas made in, and because of, the poor machine so far necessarily used, and not to the fact of compression.

The gas pump has a capacity of about 100,000 cubic feet per day, at a speed but 75 per cent. of its rated speed. As this quantity of gas, however, is as yet not required, it has been found the most desirable plan to operate it for from 30 to 45 minutes every two hours or so, pumping and storing gas in the pipe line to a pressure of 25 pounds, and letting that gas furnish the supply until the pressure falls to 5 pounds, when pumping is resumed. The temperature of the gas is increased by the compression to about 120° F. The volume of drip or condensation removed from the pipe line is about one-eighth of a gallon per 1,000 cubic feet. The loss of pressure, due to friction in the pipe line, is from 2 to 3 pounds. While the general capacity at present is about 4,000 cubic feet per hour, by increasing the speed, governor adjustment, etc., and by the use of a larger pump, the line will handle two or three times that amount in the future, if desired. Along the high pressure pipe line a number of customers are served by means of individual house regulators, reducing the pipe line pressure, whatever it may be, to 1.7 inches water pressure. One regulator controls but a single lamp post; another a large county almshouse; a third a run of 800 feet of pipe, serving about 17 houses; a fourth the lighting of a bridge. All of these regulators have worked satisfactorily continuously.

Success Leads to Extension.—The operation of the system has been so continuously and so generally satisfactory that the owners of the Company have decided to duplicate it on a much larger scale in the extensive suburban districts of Darby and vicinity immediately adjoining the city of Philadelphia. Work is under way in the district upon an initial system of about 22 miles of high pressure pipe. The trunk line from the gas works is 6 inches in size and extends to a point 3 miles distant, and from that point two lines of 3 and 4 inch pipe further extend respectively to points 7 and 8 miles away from the gas works.

The owners also of the River Shore Gas Company, serving gas in several small towns not far from Philadelphia, in the State of New Jersey, are now completing, under my supervision, a pipe line for the purpose of transmitting gas from their works at Riverton to the town of Moorestown, about 4½ miles distant. This equipment is almost identical with that at Phœnixville.

The Equipment of a High Pressure Line.—The equipment of high pressure lines, as above, with the accompanying minor parts, either necessary or desirable, may be conveniently divided into three principal parts, as below:

The compressing machinery (in duplicate), including a continuous steam supply, water jacket, speed and pressure governing mechanism, recording pressure gauges, thermometers, low pressure safety alarms, pulsation and condensing tank, meter.

The pipe line, including the matters of coating, joints, testing, drips, valves, service saddles, house pressure regulators, high pressure house meters, individual house safety appliances.

Main line regulators (in duplicate), and terminal station, including indicating gauges, recording pressure gauges, thermometers, test lights, purge and vent facilities, photometer, safety seals (main line), high and low pressure alarms, by-passes, etc.

The descriptions below of the principal items above will, perhaps, convey a fair idea of the design and character of the machinery now being used by the writer and those associated with him in the United States for high pressure illuminating gas distribution.

The Compressors.—Straight line, steam-driven, water-jacketed, horizontal Rand compressors are used. A machine, having a gas cylinder 8 inches in diameter by 12 inches stroke, operating at 140 revolutions a minute, has a practical working capacity of about 5,000 cubic feet per hour, weighs 2,100 lbs., occupies a floor space of about 2 feet by 8 feet, and requires 18-horse power at full load. A machine of about eight times this capacity, or over 1,000,000 cubic feet for 24 hours, would have a steam cylinder, probably, of 16 inches diameter, a gas cylinder of 21 inches, and a stroke of 24 inches, would weigh about 18,000 lbs., occupy a space of about 16 by 4 feet, and at 95 revolutions, with full load, would require a little over 100-horse power.

Pulsation Tank.—Immediately upon leaving the pump the gas passes into a small tank of about 140 cubic feet capacity, used for the triple purposes of absorbing the pulsation due to the action of the pump, of cooling the gas, after the heat of compression, by radiation, and of affording a convenient point for collecting and withdrawing the drip and condensation resulting from compression. The tanks used by me are of simple cylindrical form, of ¾-inch steel, tested to 125 lbs. pressure, and measuring 9 feet in length by 55 inches in diameter.

Meters.—The ordinary station meter not being suitable for measuring gas under many pounds pressure, I am at this date installing an appliance extensively used in the natural gas fields for the measurement of the very large volumes of gas there involved. In order to avoid the great expense and difficulties of constructing meters large enough to measure all the gas passing, a most ingenious arrangement of differential balanced valve is used, inserted in the run of the pipe and styled "a proportional meter." In this a fixed portion, usually 1 per cent. of the passing gas, is always diverted through and measured in a small positive meter, connected and accompanying, irrespective of what the volume of gas may be that may at any time be passing. The index of the meter that measures the 1 per cent., also multiplies the result and indicates the total volume of gas that is passing. The writer is informed that these meters are ordinarily and reasonably accurate and reliable.

The Westinghouse form is to be used in the high pressure plant at Darby, now building, and the Wylie form is used in the Riverton works mentioned. These meters are generally similar in purpose and result. They are practically of all metal construction, will withstand 50 pounds pressure, and are each very compact, a space of not exceeding 3 feet square by 3 feet in height being sufficient to contain one of a capacity of 50,000 cubic feet per hour. Connections run from 3 inches to 16 inches.

Main Line Regulators and Governors.—For the purpose of reducing from 50 or 100 pounds down to a very few pounds, say 5 or so, the appliance used in the Phœnixville plant, and perhaps the most common one in the natural gas fields, is that known as the Fulton regulator, Fig. 1.

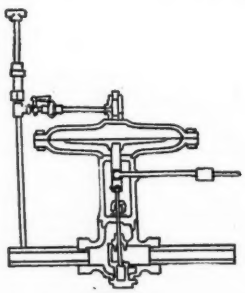

Fig. 1.

This is an automatic, vertically moving valve, operated by the action of a diaphragm above, which in turn is actuated by the gas pressure from the low side of the regulator. The action of this mechanism is very perfect and complete. It is made with connections of from 1 to 16 inches, and the smaller sizes occupy but a space of less than 3 feet square.

For the regulation of pressures of a few pounds only, ranging from 2 to 10 or 20 pounds, a form of diaphragm governor is also commonly used which reduces such pressures to a few inches water pressure and holds the same very accurately to any point desired.

Fig. 2 illustrates another form, known as the Union, in which the valve is operated by a floating bell in the tank adjacent.

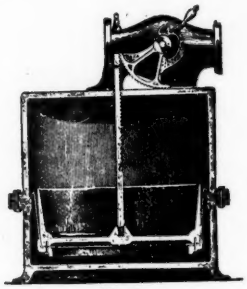

Fig. 2.

Fig. 3 illustrates a very convenient arrangement of diaphragm

Fig. 3.

governors in duplicate, used by the River Shore Gas Company at the terminus of the 3-inch pipe line. The entering gas at high pressure can be diverted through whichever governor it is desired to have in use, the other governor being out of use and affording every opportunity for cleaning, examination, adjustment, etc. By-pass, safety vents, pressure gauges, etc., are all conveniently provided in this equipment, which is known as the Johnson-Reynolds "double low pressure station."

[The sensitiveness of operation of such governors as above described was shown by the reproduction of pressure sheets. The record for two days was made on the same disk, upon which the following comment was made by the author]:

It will be observed that the ink line for the 20th was superimposed over that for the 19th, and that all of the lines for the entire week could be superimposed one over another without showing the slightest deviation from the true circle that records the fact of the maintenance of 27-tenths pressure continuously. Variation in pressure is so slight that the marking pencil does not vary more than one-half of a tenth of an inch water pressure, which variation amounts to nothing. This is in spite of the fact that pressure controlled by the regulating governors is constantly varying, according to whether the compressor at Phœnixville is pumping gas into the line and increasing the pressure, or whether it has ceased and the pressure is falling by reason of consumption. [A pressure card showed the variations in the main to range from 5 lbs. to 30 lbs.]

Main Line Safety Seal.—Immediately beyond the second regulator at Royersford a side connection or spur from the low pressure main is taken off in the regulator house and led into a small pot or vessel, near by, containing oil. This pipe seals a few inches in this oil, precisely as the dip-pipe of a bench seals in the hydraulic main. From the crown of the vessel an open discharge pipe leads through the roof.

This oil seal forms a safeguard against the possibility of the high pressure of the pipe line getting into the low pressure pipes beyond, to the damage of the meters, etc., as if the regulators should at any time get out of order and fail to work, and the high pressure should get by, it would immediately break the oil seal and vent itself through the standpipe into the atmosphere. This simple provision, it is felt, affords entire safety against serious accidents that could otherwise be possible. The oil used in such seals is of a character that will neither evaporate nor freeze.

Services.—Consumers' service connections on the high pressure pipes are made by the use of saddles, as illustrated by Fig. 4, bolted on

Fig. 4.

to the pipe. This saddle is threaded for receiving the connecting fittings, and after being placed in position requires only the boring of a hole through the wrought iron pipe to give full supply of gas. Special tools are used that entirely prevent the escape of gas in making connections.

House Regulators.—Small sizes of the low pressure main line regulators are used universally for controlling the pressure in houses along the line of high pressure mains wherever desired. Those are made in a variety of forms, but nearly always with a cast iron case of from 5 to 15 inches diameter, standing any ordinary pressure, and containing the governing valve and diaphragm. Threaded to fit standard pipes from ¾ to 2 inches in size, they are readily connected in the run of any service pipe taken off a high pressure main, and afford a capacity according to size of from 25 to 2,000 cubic feet per hour. As a class they are extremely sensitive, simple, accurate, and reliable in operation.

High Pressure Meters.—While I have so far used the ordinary tin case meters, following the house regulators as above and protected by safety seals intervening to guard against the possibility of pressure getting by the regulators and into the consumers' meters, it is likely that there will later be used, to a greater or lesser extent, some of the forms of cast iron meters built to withstand 20 or 30 pounds pressure in general use in the natural gas regions. The iron case of the Westinghouse contains a floating inverted bell, divided into chambers and sealed in oil in the lower half. This bell rotates with an undulating motion, the compartments filling and emptying in succession through a central common valve. This form of meter has no leather diaphragms, is made entirely of metal, in sizes of from 200 to 40,000 cubic feet capacity per hour, and in diameters ranging from 1 to 5 feet. The Equitable meter is also made with a cast iron case, but is of the dry pattern, with leather diaphragms, arranged vertically around the periphery, in turn filling and discharging on the lines of the ordinary meter. This pattern is made in sizes from 300 to 1,200 cubic feet capacity per hour. A very extensively used form is known as the Tobey, in which the cast iron case is globular, and contains three diaphragms connected with a central spindle operating the index above and the valve mechanism in the base of the meter.

Recording Gauges, etc.—At the terminal stations of the high pressure station at Royersford an ordinary steam gauge indicates the high line pressure of 10 to 20 pounds; an ordinary siphon gauge the low pressure of 27-tenths; a similar gauge with mercury the intermediate pressure between the high and low pressure regulators. Bristol recording gauges register the high and low pressures; and test lights, telephones, etc., are conveniently near.

Colonel William B. Wooster, President of the Derby (Conn.) Gas Company, died at his home in Derby the morning of September 20th. He was born in Oxford, Conn., August 22, 1821. Having graduated from Yale College he elected to follow the law, and opened an office in Derby. He was a member of the Connecticut House of Representatives in 1858 and in 1859 he represented the Fifth district of Connecticut in the Senate. He served through the War of the Rebellion, commencing (1862) as Captain of a company of volunteers and ending as Colonel (1865) of the 29th Connecticut Volunteer Infantry, a colored regiment. At the termination of the war he resumed the practice of his profession.

The Future of the Connellsville Coke Region.

A special correspondent of the *Engineering and Mining Journal*, writing on the topic named in the heading, says that the haste with which the operators in the Connellsville region are buying up all the available coal land on all sides is causing considerable comment in the iron world. The question naturally comes up: What will take the place of coke when the Connellsville region is merely a waste of ruined mines? It was thought that this question would be settled by the time the region was half worked out, but it is at that stage in its existence now, and the solution of the problem is no nearer than it was in the early days of the coke trade. Coke men cannot help seeing the necessity for some substitute for the coke which is leaving the region at the rate of 11,000 cars a week.

Many of the plants that were in their prime in the first history of the coke regions are now idle. Western Overton ovens are out because of the lack of coal. Hazlett Mine, near Scottdale, once a great money maker, is now nothing but a series of hollow pitfalls, and the ovens are burning coal from an adjoining pit. Uniondale, near Connellsville, has seen its finish. Two hundred ovens are out of blast at Morrell, because of the lack of fuel, and more will go out as the months go on. The old Fairchance Mine is abandoned and the ovens supplied with coal from Kyle. Frick Mine at Broad Ford is in the same state. Jackson Mine at Broad Ford has about one more year to run. Pennsville is close to exhaustion, and the Bessemer Mine, near Mount Pleasant, has begun operations on the last block of coal. Five years at most will see the end of all the mines on the Mount Pleasant Branch road. Another thing to remember is the fact that never in the history of the coke region has there been such an enormous output of coke as this year. There were many mines along the Mount Pleasant Branch that were idle for years, or they would have been exhausted before this. Their idleness saved them. The rate of production for 1898 and 1899 was almost double the average production of several years previous.

Twenty-five years is the limit usually given to the Connellsville region until it can do no more for lack of fuel. Wise men are already looking to the future contingencies which are sure to arise. It is known that there is a second vein of coal below the Connellsville 9-foot seam. A bore hole is now being drilled by the Connellsville Gas Coal Company, at Fayette Station, about a mile south of Connellsville. This Company has not been in business for a number of years, having leased the plants to the Cambria Steel people, who take all the coke. This hole is expected to reach the second 5 foot vein about 900 feet below the surface. There may be a second revival in the Connellsville region, if this vein is constant and available. The shafts in the region are from 80 to 550 feet, and these would have to be replaced by deeper ones of from 900 to 1,500 feet. It might be that the shafts which are now drilled could be extended downward and worked from the tipples and shaft frames standing, although this is merely a supposition. The test hole at Fayette is not the first attempt to locate the second vein of coal. One at Banning, on the Youghiogheny river below Connellsville, proved fruitless. The second vein is worked in many places in England and the increased demand for coke and consequent higher price will equalize the additional cost of extracting the coal from the deeper underground workings in this country.

Acres on acres of breeze are piled up in the coke region. This is pure coke, but has never been utilized because of its fineness. It is probable that as Connellsville coke is exhausted some effort will be made to use these immense piles. So much of this stuff has been dumped all along the Mount Pleasant Branch that the valley is contracted and the little creek sometimes choked up by the heaps. This coke breeze is, of course, cheaper than coal; some of it has been used at times under the boilers in the region, and there is a possibility that it will come into general use. Several railroads in New England are now burning small coke in their locomotive boilers, and a few manufacturing firms have also adopted it. A forced draft is required with it and the grate bars must be close. Coke makes little or no flame when burning, and for this reason the firebox must be shallow, so as to have the hot coke as near the heating surface as possible.

The burning of coke, especially in locomotives, is becoming more general. Coke needs little attention, so that the door of the furnace does not need to be opened frequently, thus excluding rushes of cold air which cause a slight strain on boilers besides militating against the rapid generation of steam. Boiler tubes remain clean much longer under its heat, for coke is clear and clean. The hottest coke fire is not always made by the strongest draft, a medium blast being best. It makes a white heat without forcing all the heat up the flues. These are but a few of the ways in which coke is being consumed more rapidly,

and all this tends to exhaust the coking fields and cause a demand for a substitute. The new fields that are being opened up in the southern end of Fayette county will help the situation for awhile, but they will not last longer than the old field and there is not enough of them to entirely replace the Connellsville region in the coke market.

Unutilized Comforts of Electricity.

By Mr. R. S. Hale, in *Electrical World*.

Last fall the writer moved into a new house, and in connection with the moving had occasion to inspect a number of houses, some built several years ago and others just built. Nearly all, especially those recently built, were wired for electric lighting, but so few took advantage of the comforts to be obtained from electricity that a description of a few of the ways in which the wiring could have been improved may be of interest to architects and to those about to build or wire a house.

In most cases the lights were reasonably arranged for illuminating the rooms after the lights were lit. Electricity (including, perhaps, electric gas lighting), has, however, the great advantage over other systems that the lights can be turned on or off from one or more distant points, instead of it being necessary to go to the fixture itself. For instance, a system can be so arranged that the lights in a bedroom can be turned on from outside the door, so that one can flood the room with light before entering it, and no matter where the chairs or furniture have been placed, never need stumble over them in attempting to find the light.

For electric lighting, the way in which this is arranged is known as three-point wiring, and is shown in the sketch. What are known as

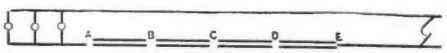

Diagram of Three-Point Wiring.

three-way switches are placed at *A* and *E*, and four-way switches at the intermediate points *B*, *C*, *D*, etc. Then the lights can, if off, be turned on at any of the switches, no matter in what position the other switches have been left; or, if on, they can be turned off at any of the switches. This system is useful in many ways. One instance in which it is especially desirable, is to have all the hall and stairway lights on such a circuit, with one of the switches at the front door, one at the foot of the stairs, and one at the landing of each story. Then when one enters the house, turning a switch lights the hall, and there is no danger of stumbling over anything, for instance, a valise carelessly left in the way. Then after going upstairs the lights can all be turned off from upstairs, and it need never be necessary to go downstairs again to turn out a forgotten light and then go up again in the dark.

While it is generally most convenient to be able to light all the stair lights from any story, it may in some cases be thought undesirable to have to light all the upper landings if only one flight of stairs is to be used. In such a case the lights can be arranged as follows: The hall light controlled by two switches, one at the front door and one at the foot of the stairs next to the switch controlling the hall light, and one at the top of the stairs, the lights for the other stairs arranged in a similar way, so that as one came in or out one would turn out the light behind and turn on the light ahead.

Stair lights may be put at the landings at the top or bottom of the stairs whenever the stairs are straight. If, however, the stairs turn, as they do in most houses, it is very much more convenient to place lights at the turn to light both the top and bottom of the stairs.

Bedroom lights can be arranged in the same way as the hall lights with much comfort. For instance, I have a three-way switch at the door of my bedroom and the corresponding switch beside my bed. I light the lights as I enter the room, and have no fear of stumbling over the furniture. I turn out the lights after I am in bed, and can light them again without getting up in case I have to rise before it is light. An even more luxurious scheme is to have a pendant switch to control a light, the switch itself lying on the pillow or under the bedclothes. With such an arrangement one can light the room without moving in the bed at all.

Another luxurious arrangement is to have an electric bed-warmer controlled by such pendant switch. Then if one wakes up in the night cold, all that is necessary is to press a button without even sitting up, and electricity does the rest.

Gas is frequently used in the servants' rooms of a house even when electricity is used in the master's rooms, on the ground of less expense. The back stairs, however, should always be lighted with electricity and provided with three-way switches as described above for the front stairs. If gas, or electricity without three-way switches is used, the back stairs will be kept lighted all the time. With three-way switches and electric lights, they need be lighted only when in actual use. The switches on the back stairs should always be push-button switches and never turn switches. The lower price of turn switches often causes their use instead of push switches, but on the back stairs the servants will frequently have occasion to light or turn off a switch when carrying a tray or similar article. This can easily be done with a good push switch, but is difficult to do with a turn switch.

Sometimes, in the master's rooms, combination fixtures are used for both gas and electricity, but are always ugly. Instead, a drop light connection for gas can be put in the canopy of the electric fixture, and a drop light used when it is desired to use gas to save expense, or for any other special reason.

Every closet in a house should be provided with an electric light, preferably a light hanging from the ceiling of the closet which will light every portion without being in the way. The comfort of never having to grope in a dark closet or to take a greasy candle in among one's clothes is one of the greatest comforts of a properly lighted house.

The cost of all the devices spoken of above will not add 25 per cent. to the cost of wiring a house, nor as much as that in many cases, and it will add 100 per cent. to the comfort. Further, these devices will, if anything, reduce the cost of current. The closet lights are used for such a short time that the amount of current is inappreciable, and the three-way switches for the halls and bedrooms reduce considerably the amount of current used, since the lights are used only when needed, instead of being left burning all the time.

This article does not attempt to describe all the comforts obtainable by electricity, but only desires to call attention to a few of the comforts that are not generally realized, although the fact that they are available is by no means a novelty.

Consolidations as a Source of Increased Competition.

Iron Age says that those who are, or pretend to be, opposed to the trusts and consolidations take a good deal of pains to exaggerate their enormous power. Their cue is to frighten the public with visions of grasping monopolies who throttle the consumer with one fist and shake labor into slavish submission with the other. The iron industry comes in for its share of attention as one in which the number of these monopolies is particularly large—although the eloquent guardians of the human race fail to observe that their logic must be somewhat at fault when they apply the title of monopolies to a number of concerns in one industry. We are told almost in one breath that the trusts are robbing the public by extortionate prices and that the fact that they have closed down many plants is evidence that the much vaunted prosperity does not exist.

Now, as a matter of fact, if there is any cause for uneasiness in the iron trade as to the future, it is that competition with the great consolidations has been increasing and threatens the stability of the trade. That competition may be classified roughly as being external and internal. The former word may be used to designate those plants which have been started as entirely new enterprises, to share with existing consolidations the liberal profits which they are shown to have earned by their published reports. The "internal" competition is that which comes from the invasion of the territory of one consolidation by another "trust."

The sharp drop in the prices during the last few months has probably nipped in the bud many enterprises projected to worry one or the other consolidation into a purchase of the competing plant at fancy figures.

In some instances "outside" undertakings have been started by men who had sold out at a handsome profit to the very "trust" which they attack. It may be said that this is inevitable because there are no means to tie down retiring interests. In this way some very ambitious and, let it be added, some, to the trusts, very dangerous enterprises have been started.

But what looks like much more disquieting competition is that which is developing among the different "trusts" themselves. With one exception, all those large consolidations which did not already go

back to the ore have striven to secure independence of the great stee making concerns by acquiring ore and coal property, and developing furnace and steel capacity. In that way they have deprived, or threaten to deprive, the large steel makers of an outlet for a considerable part of their tonnage. The result is that threats to invade this or that field have been numerous, and in some instances are being carried into effect. Competition thus develops which is on a very different basis from that between a moderate sized outsider and a huge consolidation. It becomes a strife between the giants themselves, in which heroic measures are often and suddenly taken.

That such developments are not calculated to do the iron industry any good in the long run is evident, because they lead to additions to capacity which are wholly unnecessary. Even without any new comers the productive capacity is growing simply through the fact that every consolidated group is remodeling and concentrating superannuated plant and is making improvements. It really looks as though competition, far from being done away with, may become fiercer at times than it ever has been. The corrective to the dangers of the fusion of interests during the past 18 months is being applied even more quickly than has been thought probable. The more arbitrary the "trust" management the more rapid apparently has been the advent of the dangerous rival.

The Bremer Arc Lamps.

Frequent attempts have been made to change or subdue the violet-blue color of the arc light, which is objected to as much as ever, and, if possible, at the same time to increase the light capacity of the lamp. According to a paper read by W. Wedding before the Union of German Electricians, held this year at Kiel, a considerable amount of success has after all been achieved by H. Bremer, of Neheim, on the Ruhr River. The carbons, that is, only the upper electrodes, are impregnated with salts of calcium, silicon and magnesia, up to 50 per cent. of such salts being added to the carbon. Calcium appears to be the chief ingredient. The reddish yellow flame of calcium softens the tone of the light, which the inventor claims can be varied at will. The calcium oxide coats the inside of the globe, and of the chimney which is used in some lamps, with a white deposit, which helps to diffuse the light in all directions; so that we do not see a glaring point, with unsteady, ugly shadow lines on the upper half of the globe and a zone of comparative darkness directly under the lamp, but a fairly uniform bright globe. The photometer tests, which formed the chief part of Wedding's paper, illustrate these and other features. With an arc lamp taking 12.3 amperes at 44.5 volts, Wedding observed that the light intensity was almost constant; over 6,000 candles, in the cone between 45° and 90° with the horizontal itself, the intensity was still 1,000 candless. The hemispherical intensity was 4,320 candles, which corresponds to a mean current consumption of 0.126 watt per candle. This is a very remarkably low value. The lamp was without a globe; with a globe the current consumption was 0.196 watt. The carbons are vertically arranged, not quite in alignment. The mechanism is said to be much simplified, but no real information was offered on this point, beyond stating the fact that the arc is considerably flattened out and contributes materially to the light emission. The yellow nature of the light should assist these lamps in penetrating through mists. Some preliminary experiments support this view, but the subject requires further investigation. As regards searchlights and lighthouse lamps, where this penetrating power would be of paramount importance, the large arc may prove awkward; for these lamps we want a fairly punctiform source of light. A Bremer arc lamp with four arcs has been suspended at a height of 95 meters (312 ft.), from the Eiffel Tower in the Paris Exhibition. The four arcs are arranged in two series, and take together 55.8 amperes at 89.3 volts. Tested without a globe, when suspended 8 meters (26 ft.) above the ground, light intensities of 80,000 candles resulted, the mean current consumption being 0.1 watt per candle, based upon a hemispherical intensity of 49,730 candles; the maximum light intensity was observed under an angle with the horizontal of 37°. Fitted with a globe, the hemispherical intensity was 26,890 candles, corresponding to a current consumption of 0.17 watt. The metallic vapors in the arc diminished the resistance of the arc, but the carbons burn away twice as rapidly as ordinary carbons. If, however, the ratio of the carbon section, new to old, is 1.3, as is asserted, that disadvantage would balance itself. No vapors are supposed to escape from the globe. Bremer used his carbons also with alternating current arc lamps.

SPECIAL ENGLISH CORRESPONDENCE.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, ENGLAND, Sept. 10, 1900.

A Change of Policy.—A Burner Question.—Robbery not Theft.

On the doorposts of a certain restaurant in the city of London are two mirrors, one concave perpendicularly, the other concave horizontally. The first is labeled "before dining at———," and the second, "after dining at———." The first has the effect of magnifying the length of the countenance and gives a lean cadaverous effect, but the second increases the apparent breadth and gives a jovial, well fed appearance. The inference, of course, is that the excellent quality of the viands provided by this particular caterer has exercised the remarkable transforming effect, whereas most people will be aware that the peculiar construction of the mirrors is mostly concerned in the matter. I am reminded of this amusing device by the habit that many gas engineers have established of talking of the position of the gas company, "before" and "after" the introduction of the slot meter. One frequently hears the remark that whereas 500,000 customers were obtained in 50 years, since the introduction of the slot meter, a similar number have been laid on in five years, the inference being that the tenfold growth is entirely or at any rate chiefly due to the marvelous and characteristic attractions of the slot meter. But label the long mirror "Quarterly payments, with high initial expenses," and the second "Short period payment, with no initial expense," and it will be seen that the real cause of the list of consumers being doubled in five years is due to a change in policy rather than to the slot meter. Out of the first 50,000 how many were solicited and introduced by the companies' agents? How many of them received encouragement or assistance in the matter of gas fittings? Especially in the early days the consumer had not only to provide all the cost of the inside fittings, but also a part of the service, and a fee to the company besides, and all this for the privilege of having gas at about 6s. per 1,000 cubic feet. Then the terms of business were "Quarterly payments," and he was expected to be prepared to pay the quarterly bill on demand. Some people do not stand on ceremony about asking the collector to "Call again," but as many others feel aggrieved if circumstances compel them to do so, and many of the poorer classes take a pardonable pride in paying up their debts without a second application. Where would the slot meter be with gas at 6s. per 1,000 cubic feet, a heavy initial cost for fittings, etc., and the slot open only once in three months? The second 50,000 had their supply under very different conditions. They simply gave notice at the office and the company did the rest. The rate at which the meter is set, though higher than current rates, is considerably less than the ordinary price for gas of twenty-five years ago, while solid fuels are much dearer. There is no initial cost if they can pay in driblets so small that the money is not missed, instead of having to pay by the pailful. These advantages are sufficient in themselves to command a good business, and if the ordinary meter was accorded similar support, and used in connection with no initial cost or trouble, and short period payments, the patronage of a considerable proportion of the second 50,000 would be assured. Apart from this the peculiar features of the slot system offer special attractions and are successful in securing a certain amount of business that could not be otherwise obtained.

But is there not a confession of weakness or incapacity in a statement of this sort? No one will suppose for a moment that, at or about the year 1895, a sudden crop of gas consumers appeared upon the scene like mushrooms. It is more reasonable to assume that most of them were there before, and, what is more, that they would have been willing to become consumers of gas before if the subject had been properly set before them. I notice that American gas engineers frequently talk about "attracting" gas consumers.

In England we think we do as much as can reasonably be expected if we attend promptly to those who present themselves. This is not altogether the fault of the gas manager. It is simply due to the fact that there is no item watched more jealously by directors and shareholders than that of "salaries," with the result that the staff are barely equal to carrying on the ordinary daily operations, and not one of them, from the manager downwards, has a minute to spare for consideration of the wants of the consumers. This way of doing business, or rather of not doing it, is becoming old-fashioned if not obsolete, and the success of the slot meter comes as a rude reminder that fine, old-crusted British exclusiveness is a costly luxury. In many ways we are the slaves of old established custom, and especially is this the case in regard to the matter of quarterly payments. Some efforts have been made in London and Manchester in the direction of weekly or monthly

payments, but most gas companies have accepted the quarterly payment as indispensable, and that gas could not possibly be sold on other terms. But many of the large number who now drop their humble coins into the slot every week, have never purchased a quarterly supply of any sort in one sum, but provide of their necessities from day to day. Perhaps if gas companies would organize a proper selling department and just look around and find out what their customers really do want, or, what is the same thing, can be persuaded to want, it may turn out that there is a third crop waiting to be unearthed, by getting clear of the rut of custom, realizing the particular requirements, and then offering special terms that will meet them.

Messrs. Geo. Bray & Company, the well known gas engineers of Leeds, are to be congratulated upon their public spirit in exposing a somewhat shabby trick of the trade. They issue specially prepared, illustrated show cards with metal clips adapted to hold specimens of their particular makes of burners. Each one is labelled at the back to the effect that no other make of burner may be attached or used in connection with the card—a very fair and reasonable stipulation. The commercial manager of the firm happened by chance to be passing a certain shop, and noticed one of the show cards, in respect to which this condition had not been observed, but another make of burner had been substituted for Bray's. The result was a prosecution for using a false made description, and for unlawfully selling goods under the same. The defence was to the effect that the notice on the back of the card had not been read, and that another make of burner had been inadvertently placed thereon. As regards the first part of the charge the defendants obtained the benefit of the doubt, but the second part was considered proved, and a fine of £5 with costs was imposed. It may be safely assumed that the other make of burner was not superior to "Bray's," and the firm naturally object to any abuse of the conditions under which the show card is provided.

But the case may be viewed from another point as the sale of spurious and inferior imitations also concerns the credit of gas and of gas companies. The purchaser of a Bray's burner, or of one represented as being of Bray's manufacture, very reasonably believes that he has obtained a reliable, genuine article that will insure satisfactory results. If his expectations are not realized, he may probably blame the quality of the gas supply. If he complains at the place where he bought the burner, the chances are not in favor of a correct explanation being obtained, and he would rather be encouraged to believe in the dishonesty or negligence of the gas company. "Please sir, it wasn't me," was always a favorite excuse with the guilty culprit, and in numerous cases a general charge against the gas has served as a cloak for the ignorance of the gasfitter. The moral of the thing is that gas companies will do well to take a leaf out of the book of Messrs. Bray's manager, and look at the show cards and other business methods adopted with regard to the sale of gas burners in their district. They must not allow meters and cooking stoves to exhaust their energies, but take a proper degree of interest as regards assisting their customers in the selection of the best lighting appliances in the market—a point which is generally viewed with absolute indifference. I do not insinuate for a moment that the case above instanced is other than exceptional, but it is notorious that a vast amount of cheap, inferior gas appliances is on the market, with results that are not helpful to the increased use of gas.

An extraordinary decision was arrived at by a Manchester magistrate in respect to robbing from a slot meter, and if it is allowed to pass into a precedent, gas companies will need some further protection in regard to the funds accumulated in the cash receptacles attached to these useful appliances. It is obvious that many of the meters must of necessity be placed in exposed or easily accessible locations and, therefore, the property of the company requires the fullest protection that the law can afford. But according to the Manchester Stipendiary, any person who is short of cash may proceed to the nearest slot meter negotiate the lock with the aid of a false key or otherwise, and "borrow" a sum sufficient for present requirements, without being guilty of theft. The only crime committed is an "Offence against the gas act." If this is good law needy people without credit would do well to lay in a stock of false keys. Further, there is not much difference between taking money from a cash box belonging to a gas company or from a pocket belonging to an individual, and one may not unreasonably expect that in the next case of pocket picking or theft from a shop till coming before the Manchester bench, the prisoner will plead that he did not steal the watch or the cash, but that he intended to return it. The facts of the case in question were that one of the inspectors employed by the Manchester Corporation, on opening the till attached to a meter in a house at the time unoccupied, found only 1s. 3d. instead of 7s. 5d., the sum shown by the register to have been put in. After considerable trouble, the "borrower," having changed her address, and also by an extraordinary oversight ommitted to leave an I. O. U. or other acknowledgment of the debt, the missing money was traced. The lady admitted that, by means of the good services of a neighbor, who was fortunately the possessor of a key that fitted the lock of the slot meter, she had obtained access to the cash box, and taken out 5s. 5d , with the intention of putting it back. The magistrate seemed to be strongly impressed with the idea that the action did not constitute a theft, but appears to have altogther overlooked the question of whether it is a lawful or innocent action to tamper with the lock of a box belonging to another party. Most people who possess ordinary common sense, if no knowledge of law, would agree that the picking of the lock of a cash box and removing part of the contents constituted a criminal act, and that the plea of honorable intentions is not a sufficient defence. If everyone is at liberty to "borrow" without the consent of the owner, no property can be safe. Evidently it is an important feature of any slot business system that the cash receptacle must be protected from tampering of any sort, whether by borrowers or others, and it is to be hoped that some means may be forthcoming for obtaining an authoritative pronouncement as to how far this extraordinary decision is correct according to law.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

MR B. B. ODELL, JR., the Republican candidate for Governor of New York, is said to have sold out his interest in the gas and electric lighting properties of Newburgh, N. Y., to a syndicate prominent in the management of which is Mr. F. R. Bain, of Poughkeepsie, N. Y.

THE new ship building plant for the Risdon Iron Works, at San Francisco, Cal., will be built by the American Bridge Company, of New York. The plant includes a boiler shop, machine shop and foundry, all to be of the latest design and most modern description.

MR. J. KATZENBERGER, General Manager of the Kern Incandescent Gas Light Company, 18 Murray street, New York, writing under date of September 21st, says, among other things: "We inclose you copy of telegram received from the Spokane Falls Gas Light Company, Spokane, Washington, which speaks for itself." The telegram is appended:

"SPOKANE, WASH., Sept. 17, 1900.

"To Kern Incandescent Gas Light Company, 18 Murray street, New York City.—Express stalactite holders and fancy globes: three burner. Notify AMERICAN GAS LIGHT JOURNAL Spokane Gas Light Company's offices lighted throughout. Great success.—SPOKANE FALLS GAS LIGHT COMPANY."

A CORRESPONDENT who attended the International Congress of Gas Engineers, and who has made a close examination of the gas manufacturing plants of many European cities, writing from Denmark under date of September 13th, says: "The Congress at Paris no doubt was most interesting to those who understood French. I didn't. It was a success, however, and a great 'mutual admiration' affair. Ten Americans showed up, 60 Englishmen, 250 Frenchmen, Germans, Italians, etc. Everything here [meaning Europe generally] in the line of new generating construction is in the line of inclined retorts. They are working beautifully, and the United States is behind the procession."

THE Board of Gas and Electric Light Commissioners will, within a fortnight, hear testimony on the petition for a reduction in the gas rate at Waltham, Mass.

THE authorities of Webb City, Mo., have granted a franchise for the construction and operation of a gas works there to promoters said to be residents of Des Moines, Ia. They were represented in the application by Mr. A. A. Hamilton, of Joplin, Mo.

ANOTHER attempt is being made to establish a gas company in South Amboy, N. J.

THE plant of the Clinton (Ills.) Gas Company is in satisfactory operation.

THE Union Stock Yards Gas Company, of Chicago, has been incorporated by Messrs. Albert H. Veeder, Edward Tilden and Henry Veeder. It is capitalized in $5),000. So far, the purpose of the or-

ganization is not clearly disclosed; that is, in the advices respecting it that we have received.

THE Long Beach (Cal.) *Press* says that constructive work on the plant of the proposed gas company for Long Beach is underway. Manager Lowe is quoted as saying that gas will be sent out in the regular way for consumption before December 1st.

THE properties of the Newton (N. J.) Gas Light Company have been purchased by Messrs. Francis Hughes, Thomas H. Moore and William McKenzie, of East Rutherford, and Amos L. Prescott. They propose to rebuild the works.

THE Southport (Conn.) Gas Company has been incorporated by Messrs. M. V. Woodward, R. E. Bibbins and M. V. Woodward, Trustee. The concern is capitalized in $5,000, and the promoters are inclined to operate a "central station" acetylene gas supply.

MR CLINTON ROGERS WOODRUFF, Secretary of the National Municipal League of Philadelphia, read at the Milwaukee meeting (Sept. 19), of the National Municipal League, a paper entitled, "A Year's Municipal Development." As a whole the paper was well written, and the author dealt temperately with his topic, which is rather unusual in one who favors municipal rule on expanding lines. Referring to the subject of "municipal ownership of municipal monopolies," Mr. Woodruff said: "There has been no abatement of public interest in the subject of municipal ownership of municipal monopolies. Indeed, there seems to be a general acquiescence in the contention that each city should own all its franchises; although there is still a great diversity of opinion as to whether the city should control or operate them. There are few, indeed, who are willing to maintain that a city should give away or sell for all time the right to run street railways, to furnish heat, light, water, or other municipal necessities. To advocate such a policy would be to sanction the utilization of city property for the benefit of the few at the expense of the many. There are few who are willing to do this, so that the discussion has practically narrowed itself down to the determination whether the city shall merely control the franchise in a general way, reserving a fair rental, or whether it shall actually operate the plants directly. In considering this phase we find that the concensus of opinion seems to be in favor of the operation of water plants and the control of street railway operations, with opinion about equally divided on the subject of lighting. One thing is perfectly sure, and that is, as a result of all this discussion concerning municipal ownership, control and operation, there has been a material improvement in the conditions which the city has been able to impose; and secondly the people have been interested as nothing else has succeeded in doing, in questions of local government. Matters pertaining to water, heat, light and transportation come home directly to the average citizen, and any policy affecting them appeals to him as no others do.

THE Massachusetts State Board of Gas and Electric Light Commissioners on September 18th handed down a decision in the case of the Amesbury and Salisbury Gas Company on a petition of the citizens of that town relative to the selling rates for gas. The decision first recites the organization of the Company, which, prior to 1887, purchased its gas from the Salisbury Mills Manufacturing Company. The Company was organized in 1859, and in 1887 a plant for the manufacture of water gas was constructed, and its capital was increased to $60,000 and since then additions have been made to the plant. The Company supplies no gas in the town of Salisbury. Its sales for the year ending June 30, last, were 6,363,000 cubic feet, at prices ranging downward from the nominal rate of $2 to less than the average cost to the Company. Its total receipts were less than $10,000, its operating expenses about $7,800, leaving a difference of $2,100. At the hearing held on the petition there was criticism of the price, inequitable discriminations in the rates to consumers, and of poor service and inferior quality of the light. The report says that it appeared during the winter, in the hours of greatest consumption, the lights were so dim and feeble as to be worthless in many localities, the public library being obliged to discontinue the use of gas. The gas was laden with sulphuretted hydrogen, the most offensive of all the impurities forbidden by statute. Complaints of consumers had long been frequent, but neither these nor the fines for using impurities had availed to improve the conditions. In many ways the use of gas became an annoyance, rather than an advantage. Although the causes were obvious, the remedy was radical and expensive, and the Company was unwilling to apply it. It demanded the reconstruction of the generating plant and greater care in its manipulation, the improvement of the purifying plant, and the laying of a liberal amount of new mains. It is gratifying to note that the new management has been impressed with the importance of these improvements, and has since the hearing been actively engaged in their introduction. The generating apparatus has been reconstructed; a new purifying plant is nearly ready for installation; a new station meter has been built, and new main pipes are being laid. With these improvements there is reason to believe that the cause of complaint about the quality of the gas will be entirely removed. Of the Company's output, more than 30 per cent. appears to have been sold at less than cost. Some of the worst abuses in this direction have been stopped, but no change has been made in the case of the largest customer to which this criticism applies. An advance in this price seems to be required in the interest of the other customers. The present margin between the income and the operating expenses is too small to allow the declaration of a dividend. It is more than probable that for some time to come an amount equal to this apparent profit should be expended upon the plant to secure to the people of Amesbury the kind of service to which they are entitled fairly. The town ought to consume a much larger amount of gas, and with an improved service and more liberal policy will undoubtedly do so. In this alone lies the prospect of profit or lower rates to the consumers. There is little in the present situation to justify a reduction in price or the payment of a dividend, and the Board has so decided.

THE new offices of the Ann Arbor (Mich.) Gas Company are a credit to itself and to the city which harbors it. Manager Douglas has been very successful this season in the placing of gas ranges, and the output is consequently increasing at a very gratifying rate.

THE Board of Aldermen of Louisville, Ky., has refused to pass over the veto of Mayor Weaver the ordinance formerly passed known as the fuel gas ordinance. The text of the veto itself may be found in the JOURNAL for September 17, p. 453.

THE proprietors of the Suburban Gas and Electric Company, of Revere, Mass., have applied to the State Board of Gas and Electric Light Commissioners for the right to issue $100,000 of new stock, the proceeds to go towards the construction of a new plant.

A LARGE shipment of cast iron gas pipe, manufactured at Anniston, Ala., was recently made from Newport News, Va. It is billed to Copenhagen, Denmark.

THE City Council of Clinton, Iowa, has agreed to extend the franchise of the Clinton Gas Light and Coke Company for a period of 25 years, the main conditions being that the grant is not to be understood as comprising exclusive privileges; that the rate for illuminating gas shall not exceed $1.40 per 1,000, gross, or $1.25 per 1,000 net; that the rate for a fuel supply shall not exceed $1.15 per 1,000 gross, or $1 per 1,000 net; that the city may, at each period of 5 years, elect to purchase the plant, the value of same to be determined by a board of 7 arbitrators—"growing value," or value of unexpired term not to be considered; that the illuminating power of the gas supply shall not be less than 20 candles; and that the city shall have its supply on public account at the rate of 25 per cent. under the lowest commercial rate.

MR. H. D. WHITCOMB, JR., is superintending for the United Gas Improvement Company, which has secured the contract, the construction of two water gas sets for the Richmond (Va.) Municipal Gas Works.

THE Chicago *Tribune*, of the 22d September reported that on Monday last Ald. Patterson, of the 12th Ward, of Chicago, would present an ordinance directing that within a certain time the gas rate in Chicago should be reduced to 75 cents per 1,000 cubic feet. Continuing, the *Tribune* said: "The terms of the ordinance do not recognize the existence of the Municipal Gas Company, but make the provisions effective for the People's Gas Light and Coke Company, the Ogden Company, and any other company, corporation, person or persons who are now furnishing or may hereafter furnish gas to consumers in Chicago. The right of the city to regulate the price of gas is not recognized as yet, and it is expected that an act of the Legislature will be necessary before city ordinances will be valid. The introduction of such measures, however, will follow the demand of citizens in all

(*Concluded on page* 534.)

THE AMERICAN GAS LIGHT JOURNAL

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PROPRIETORS.

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Germany—Lemcke & Buechner, of New York.
England—Aug. Siegle, 30 Lime Street, London.

MONDAY, OCTOBER 1, 1900.

(*Continued from page* 533.)

wards of the city where consumers have protested against discrimination and high rates. Alderman Patterson's ordinance also provides that gas shall be furnished so as to afford a light of not less than 20-candle power. The penalty prescribed for failure to furnish such light or for violation of the provision for 75 cent gas is a fine of not less than $25 nor more than $200 for each offense. Five per cent. compensation to the city is required by another section of the ordinance. The provision is that the gas companies shall make quarterly payments in January, April, July and October, accompanied by a statement verified by oath, the 5 per cent. to be of the gross receipts. The City Controller is given the authority to appoint an agent to examine the books of the Company and ascertain if the statements upon which the compensation is paid are correct."

DIFFUSION of light by glazing and glass of different kinds is to be made the subject of careful tests by the Boston Manufacturers' Mutual Fire Insurance Co. The tests will be conducted by Mr. Charles L. Norton at the Massachusetts Institute of Technology. In the Walker Building of this Institution there is a large room 60 feet wide, lighted on each side, and of such height as closely to correspond to a room in a factory of that width. There are also basements in which tests of deflection as well as diffusion may be made in the most thorough manner. The representative of each type of prismatic, of rectilinear or curvilinear glass has been requested to contribute examples of glass and to give such supervision and attention to the matter as may assure each and all contributors of the absolutely impartial methods adopted for comparison. Several representatives of different types of glass have contributed the glass and have also contributed toward the expense of the undertaking. Others have declined, but examples of their glass have been secured, and if they do not choose to exercise any super vision in order to be assured of the impartiality of the test, the undertaking will go on without their co operation. In the final report the names will be given of those who have contributed and of those who have declined to meet the test. This is the second series of tests of this kind, and copies of the report on the previous tests can be obtained by addressing the Association at 31 Milk street, Boston, Mass.

The Market for Gas Securities.

The past week's dealings in city gas shares were quite like those reported since August last. The volume of trading in Consolidated was quite large, with a decided tendency to weakness. To-day (Friday) the opening was made at 166 to 166¼, and at the close the figures were 165½ to 166. The payments on account of the 25 per cent. "rights" stock have been made, and it is fair to presume that some of this will shortly come on the market. The output of the Company is wonderfully well maintained, as between the 65 cent rate of a year ago and the $1.05 rate of to day. The sales this summer on account of fuel uses were really astonishing. Standard common has been inquired for and good bids have also been made for Mutual. The first fortnight of this month should bring out something positive in respect of the ultimate disposition of the Standard and Mutual Companies.

Brooklyn Union is nominally 160 to 168. Peoples, of Chicago, still reflects the best efforts for the short side of a certain Chicago clique. On a money earning basis the Company is in excellent position. Baltimore Consolidated is notably lower, and Laclede issues are also weaker.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

OCTOBER 1.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated—Ex rights....	$4,595,200	100	165¼	166
Central Union, Bonds, 5's..	3,000,000	1,000	103	107½
Equitable Bonds, 6's.....	1,000,000	1,000	105	..
" 1st Con. 5's.....	3,300,000	1,000	120	..
Metropolitan Bonds	658,000	..	108	112
Mutual.....	3,500,000	100	297	305
" Bonds.....	1,500,000	1,000	100	102
Municipal Bonds.....	750,000	..	..	..
New Amsterdam Gas Co.. .				
Bonds, 5's	11,000,000	1,000	105	105¼
Northern Union, Bonds, 5's.	1,250,000	1,000	102	105
New York and East River..				
Bonds 1st 5's.....	3,500,000	1,000	105	106¼
" 1st Con. 5's.....	1,500,000	..	115	..
Richmond Co., S. I.....	348,650	50	70	..
" Bonds.....	100,000	1,000	..	..
Standard.....	5,000,000	100	121	125
Preferred.....	5,000,000	100	141	145
Bonds, 1st Mortgage, 5's	1,500,000	1,000	110	114
Yonkers	299,680	500	130	..
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	160	168
" " Bonds (5's)	15 000,000	1,000	118	119
Bay State.....	50,000,000	50	1	1¼
" Income Bonds.....	2,000,000	1,000	..	75
Binghamton Gas Works....	450,000	100	93½	90
" 1st Mtg. 5's.....	475,000	1,000	96½	100½
Boston United Gas Co.—				
1st Series S. F. Trust....	7,000,000	1,000	82	85
2d " " "	5,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	4	5
" " Bonds, 5's	5,250,000	1,000	63	65
Capital, Sacramento	500,000	50	..	35
Bonds (6's)..	150,000	1,000	..	..
Central San Francisco.....	2,000,000	..	106	108
Chicago Gas Co. Guaranteed Gold Bonds.....	7,650,000	1,000	104	104¼
Cincinnati G. & C. Co.....	8,500,000	100	199¼	201
Columbus (O.) Gas Co., 1st Mortgage Bonds.....	1,907,000	1,000	106	107
Columbus (O.) Gas Lt. & Heating Co	1,682,720	100	60	65
Preferred.....	3,095,500	100	84	86
Consumers, Jersey City Bonds	600,000	1,000	102	105
Consumers, Toronto.....	1,700,000	50	230	235
Consolidated, Baltimore...	11,000,000	100	53¼	54¼
Mortgage, 6's.....	3,600,000	..	..	118
Chesapeake, 1st 6's.....	1,000,000	..	..	..
Equitable, 1st 6's.....	910,000	..	..	..
Consolidated, 1st 5's....	1,490 000	..	..	112
Consolidated Gas Co. of N.J.	1,000,000	100	10	15
" Con. Mtg. 5's.....	880,000	1,000	80	85
Consolidated G. & E. Co.'s., Little Falls, N.Y.....	90,000	100	..	100
Bonds.....	75,000	..	..	100
Detroit City Gas Co.....	4,560,000	50	95	97
" Prior Lien 5's.....	4,598,000	1,000	99¼	100
Detroit Gas Co., 5's.....	386,000	1,000	100	101
" Inc. 5's.....	16,000	100	94	94½
Equitable Gas & Fuel Co., Chicago, Bonds.....	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	35	40
Fort Wayne	2,000,000	..	35	41
" Bonds.....	2,000,000	..	60	64
Grand Rapids Gas Lt. Co..	1,000,000	50	105	107
" 1st Mtg. 5's.....	1,125,000	1,000	..	..
Hartford.....	750,000	25	..	220
Hudson County Gas Co., of New Jersey.....	10,500,000	..	25	..
" Bonds, 5's.....	10,500,000	..	101	103
Indianapolis.....	2,000,000	..	70	80
" Bonds, 6's.....	2 650,000	..	98	100
Jackson Gas Co.....	250,000	50	70	75
" 1st Mtg. 5's.....	250,000	1,000	101	102½
Kansas City Gas Light Co., of Missouri.....	5,000,000	100	..	26
Bonds, 1st 5's.....	3,333,000	1,000	101¼	103
Laclede, St. Louis	7,500,000	100	68¼	70
Preferred.....	2,500,000	100	95	100
Bonds.....	10,000,000	1,000	110	110¼
Lafayette Gas Co., Ind.....	1,000,000	100	35	40
Bonds.....	1,000,000	1,000	80	85
Louisville.....	2,570,000	50	110	120
Madison Gas & Elec. Co....	400,000	100	70	75
" 1st Mtg. 6's.....	350,000	1,000	102½	108
Montreal, Canada	2,000,000	100	182	184½
Newark, N. J., Con. Gas Co	6,000,000	..	..	55
Bonds, 6's.....	4,600,000	..	..	103
New Haven.....	1,000,000	25	280	300
Nashville Gas Lt. Co.....	1,000,000	50	110	..
Oakland, Cal.....	2,000,000	..	46	47
" Bonds.....	750,000	..	..	..
Peoples G. L. & Coke Co., of Chicago.....	25,000,000	100	84½	86¾
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage....	20,100,000	1,000	90¾	91
2d "	2,500,000	1,000	104	105
Rochester Gas & Elec. Co..	2,150,000	50	88	..
Preferred.....	2,150,000	50	118	..
Consolidated 5's.....	2,000,000	..	87¼	90
San Francisco, Cal.	10,000,000	100	47¼	47½
St. Paul Gas Light Co.....	1,500,000	100	48	52
1st Mortgage 6's.....	650,000	1,000	82	85
Extension, 5's.....	600,000	1,000	..	..
General Mortgage, 5's..	2,498,000	1,000	88	90¼
St. Joseph Gas Co.....	1,000,000	100	25	35
" 1st Mtg. 5's.....	750,000	1,000	96¼	98
Syracuse, N. Y.	1,750,000	100	..	11
Bonds.....	1,612 000	1,000	88¼	93
Washington, D. C	2,600,000	20	266	267
First mortgage 6's.....	600,000	..	..	..
Western, Milwaukee.....	4,000,000	100	90	91
Bonds, 5's.....	3,880,500	.	107	107½
Wilmington, Del.....	600,000	50	200	210

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DIVIDEND NOTICE.

OFFICE OF THE UNITED GAS IMPROVEMENT CO., N. W. CORNER BROAD AND ARCH STS., PHILA., PA., Sept. 12, 1900.

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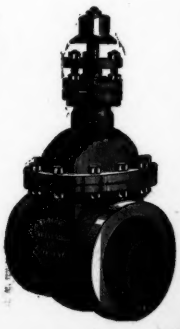

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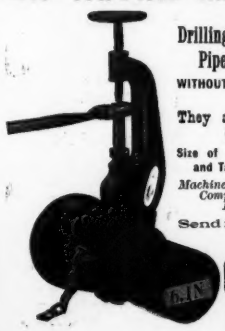

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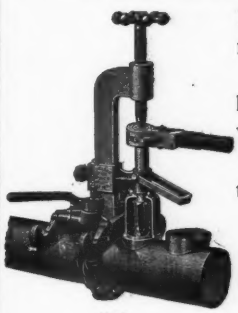

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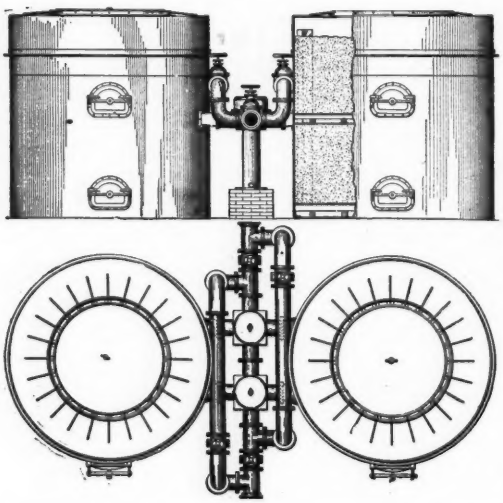

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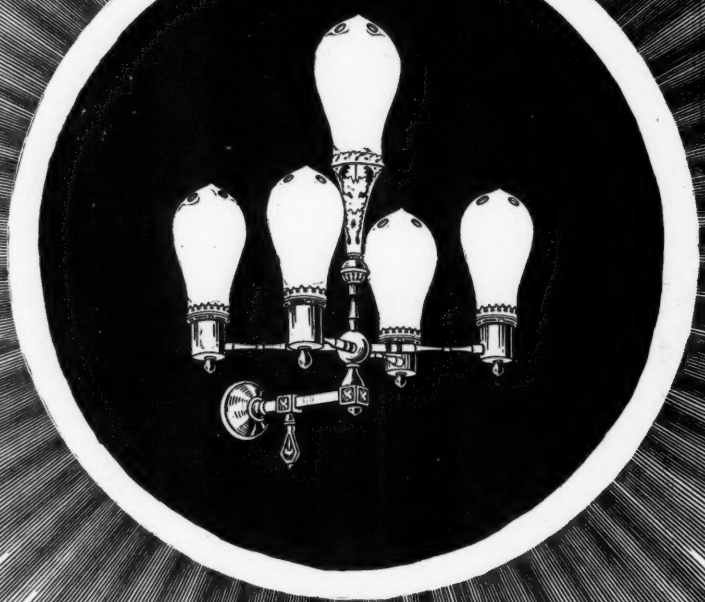

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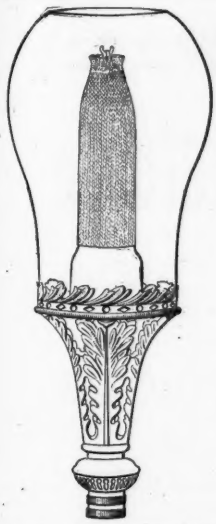

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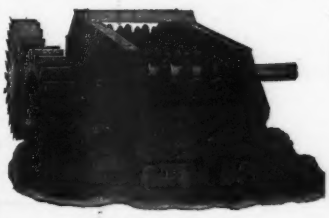

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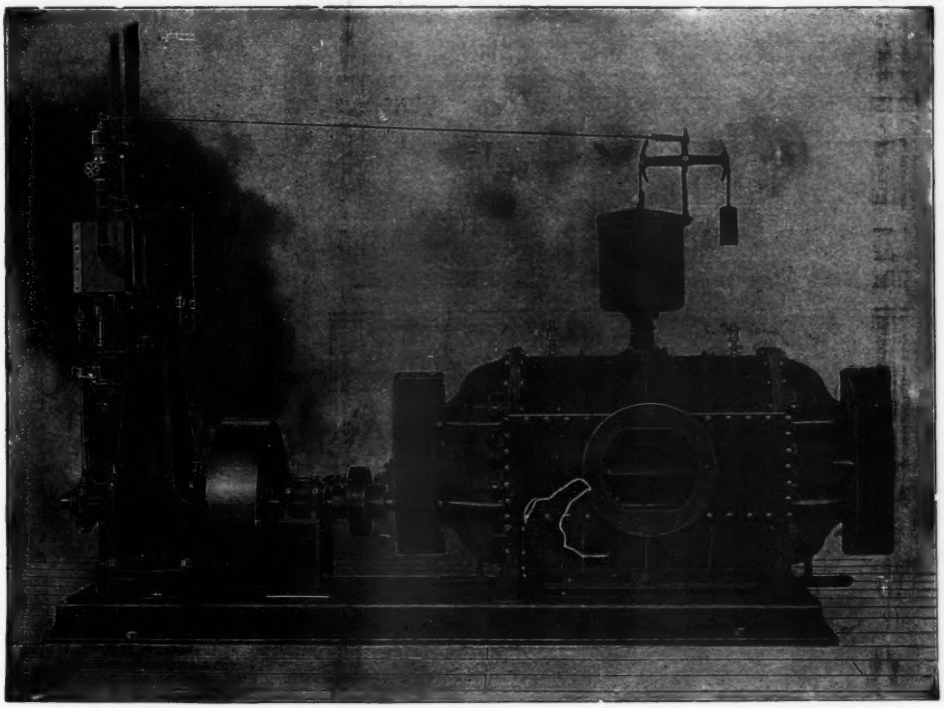

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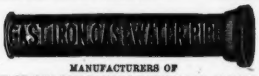

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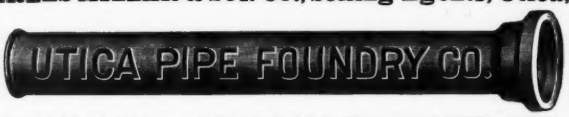

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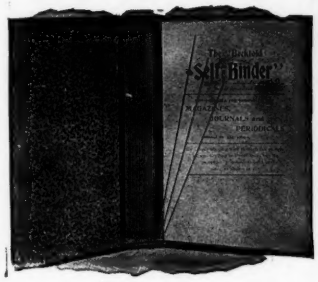

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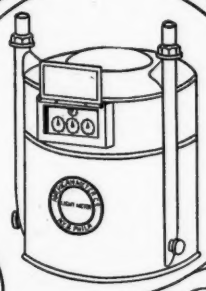
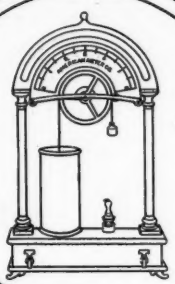
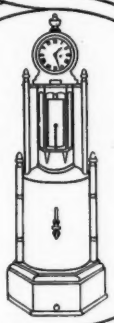
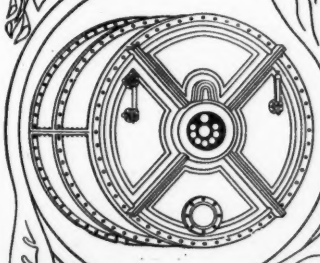








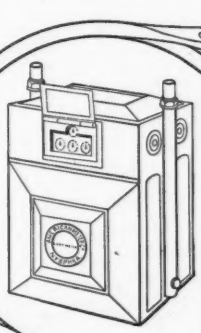
PUBLIC LIGHTING TABLE.

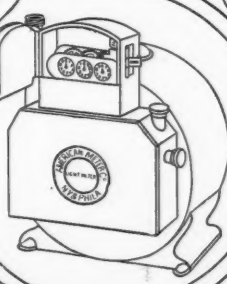
OCTOBER, 1900.

Day of Week.	Table No. 1. FOLLOWING THE MOON.			Table No. 2. NEW YORK CITY. ALL NIGHT LIGHTING.	
	Date.	Light.	Extinguish.	Light.	Extinguish.
				P.M.	A.M.
Mon.	1	10.00 FM FQ	5.00 AM	5.30	5.00
Tue.	2	11.00	5.00	5.30	5.00
Wed.	3	12.10 AM	5.00	5.30	5.00
Thu.	4	1 20	5.00	5.30	5.00
Fri.	5	2.40	5.00	5.30	5.00
Sat.	6	3.50	5.00	5.30	5.00
Sun.	7	No L.	No L.	5.30	5.00
Mon.	8	No L. FM	No L.	5.20	5.10
Tue.	9	No L.	No L.	5.20	5.10
Wed.	10	6.00 PM	7.50 PM	5.20	5.10
Thu.	11	6.00	8.40	5.20	5.10
Fri.	12	6.00	9.40	5.20	5.10
Sat.	13	6.00	10.40	5.20	5.10
Sun.	14	5.50 LQ	11.40	5.20	5.10
Mon.	15	5.50	12.40 AM	5.10	5.20
Tue.	16	5.50	1.40	5.10	5 20
Wed.	17	5 50	2.40	5.10	5.20
Thu.	18	5.50	3.40	5.10	5.20
Fri.	19	5.50	4.30	5.10	5.20
Sat.	20	5.50	5.20	5.10	5.20
Sun.	21	5.40	5.20	5.10	5.20
Mon.	22	5.40	5.20	5.00	5.30
Tue.	23	5.40 NM	5.20	5.00	5.30
Wed.	24	5.40	5.20	5.00	5.30
Thu.	25	5.40	5.20	5.00	5.30
Fri.	26	5.40	5.20	5.00	5.30
Sat.	27	5.40	5.20	5.00	5.30
Sun.	28	7.50	5.30	5.00	5.30
Mon.	29	8.50	5.30	4.45	5.35
Tue.	30	10.00 FQ	5.30	4.45	5.35
Wed.	31	11.00	5.30	4.45	5.35

TOTAL HOURS LIGHTING DURING 1900.

By Table No. 1.	Hrs.Min.	By Table No. 2.	Hrs.Min.
January	230.50	January	423.20
February	175.40	February	355.25
March	189.00	March	355.35
April	160.30	April	298.50
May	150.40	May	264.50
June	137.00	June	234.25
July	152.00	July	243.45
August	171.50	August	280.25
September	187.20	September	321.15
October	213.10	October	374.30
November	221.50	November	401.40
December	231.50	December	433.45
Total, yr.	2221.40	Total, yr.	3987.45





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POINTS OF MERIT:

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IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

No. 38.

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Welsbach Famous Mantles.

THE INCOMPARABLE

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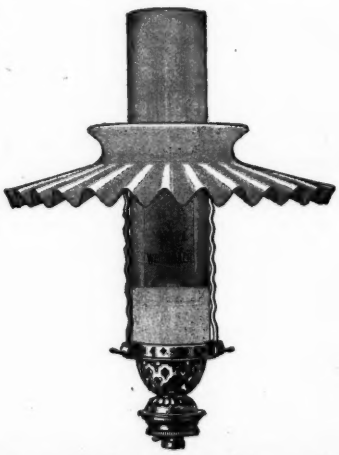
FINEST EXAMPLE

OF INCANDESCENT

GAS LIGHT

EVER EXHIBITED.



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THE STANDARD DOUBLE SUPERHEATER LOWE WATER GAS APPARATUS.

CONTRACTS RECEIVED SINCE JANUARY 1, 1900.

	SETS.		SETS.
DANSVILLE, N. Y.	1	CARBONDALE, PA.	1
WEST CHESTER, PA.	1	HACKENSACK, N. J.	1
COHOES, N. Y.	2	TIFFIN, O.	1
OGDEN GAS CO., CHICAGO	1	MOUNT HOLLY, N. J.	1
CENTRAL UNION GAS CO., NEW YORK	1	SEATTLE, WASH.	1
SPENCER, MASS.	1	TARRYTOWN, N. Y.	1
SAN FRANCISCO	1	HOBOKEN, N. J.	2
BROOKLYN UNION GAS CO., BROOKLYN	1	PATERSON, N. J.	2
RICHMOND, VA.	2	NEWARK, N. J.	2
CAMBRIDGE, MASS.	2	JERSEY CITY, N. J.	1

NUMBER OF SETS	26
TOTAL SETS INSTALLED TO JANUARY 1, 1900	327
TOTAL SETS INSTALLED TO DATE	353
TOTAL DAILY CAPACITY	226,600,000 Cubic Feet.

The United Gas Improvement Company,

Broad and Arch Streets, Philadelphia.

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In Kegs, 100 to 200 " " 6 " "
In Kegs less than 100 " " 7 " "

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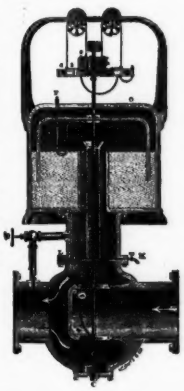

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FOR GAS PURIFICATION.
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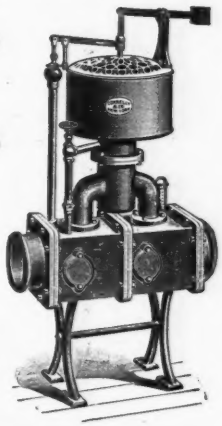

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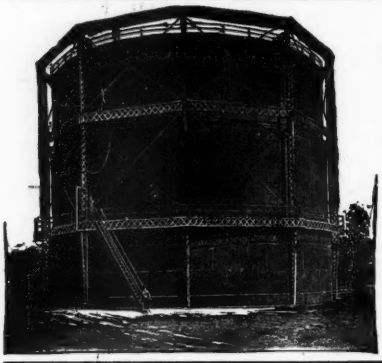

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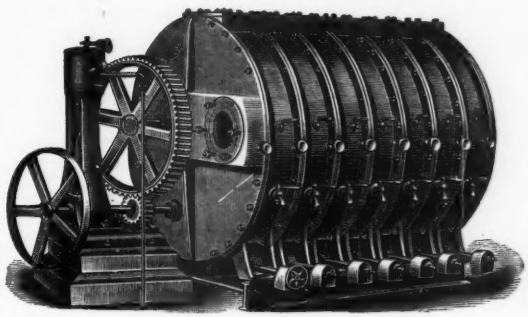

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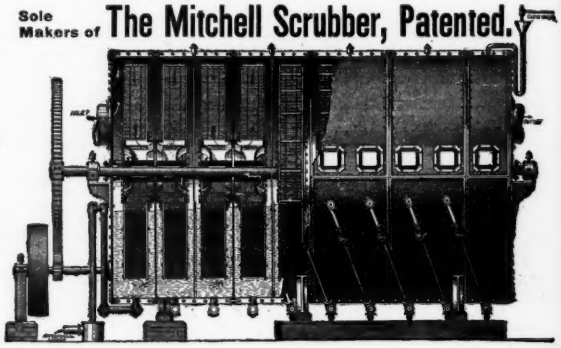

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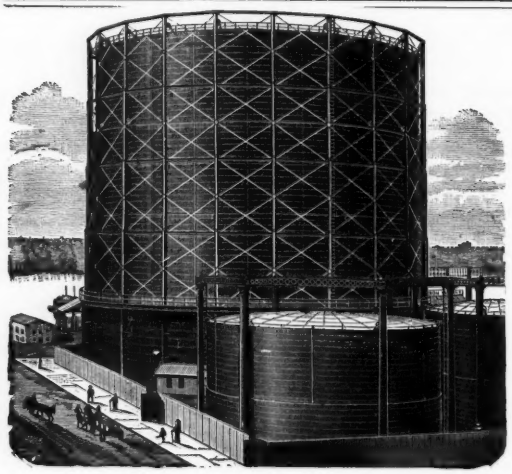

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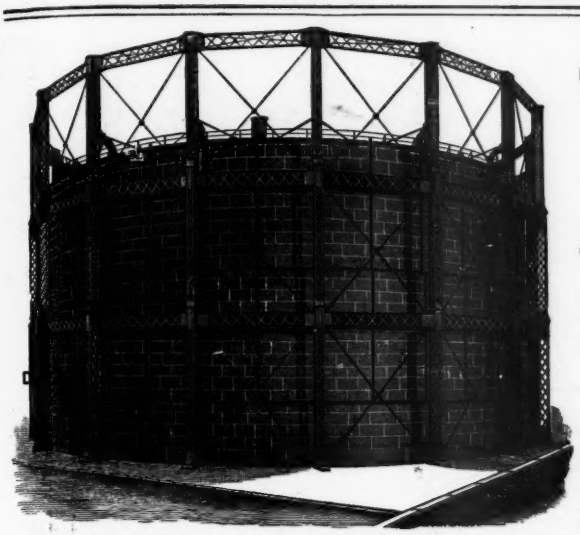

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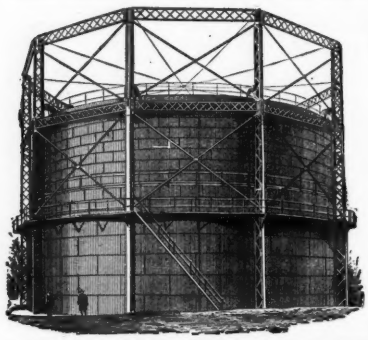

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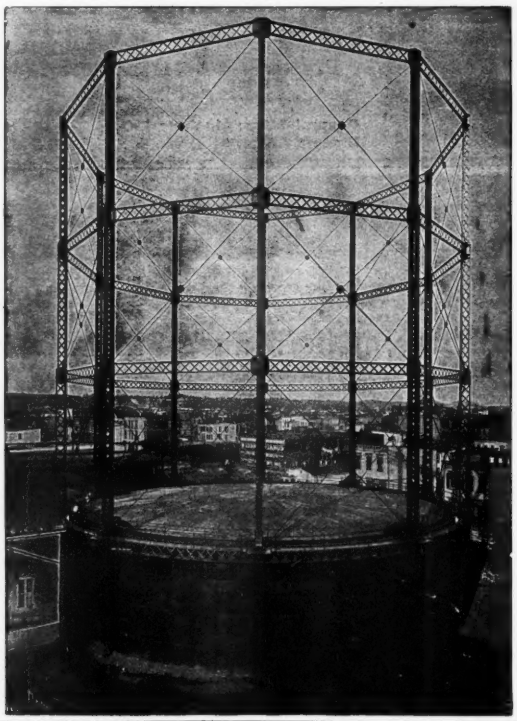

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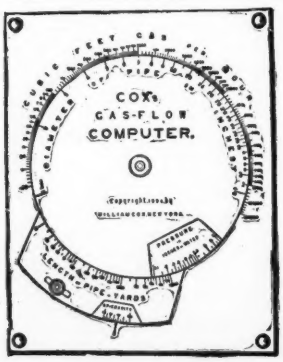

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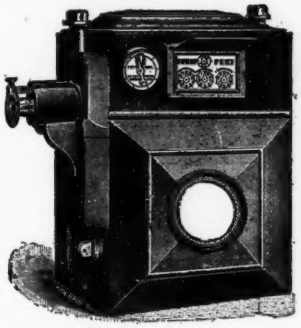

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